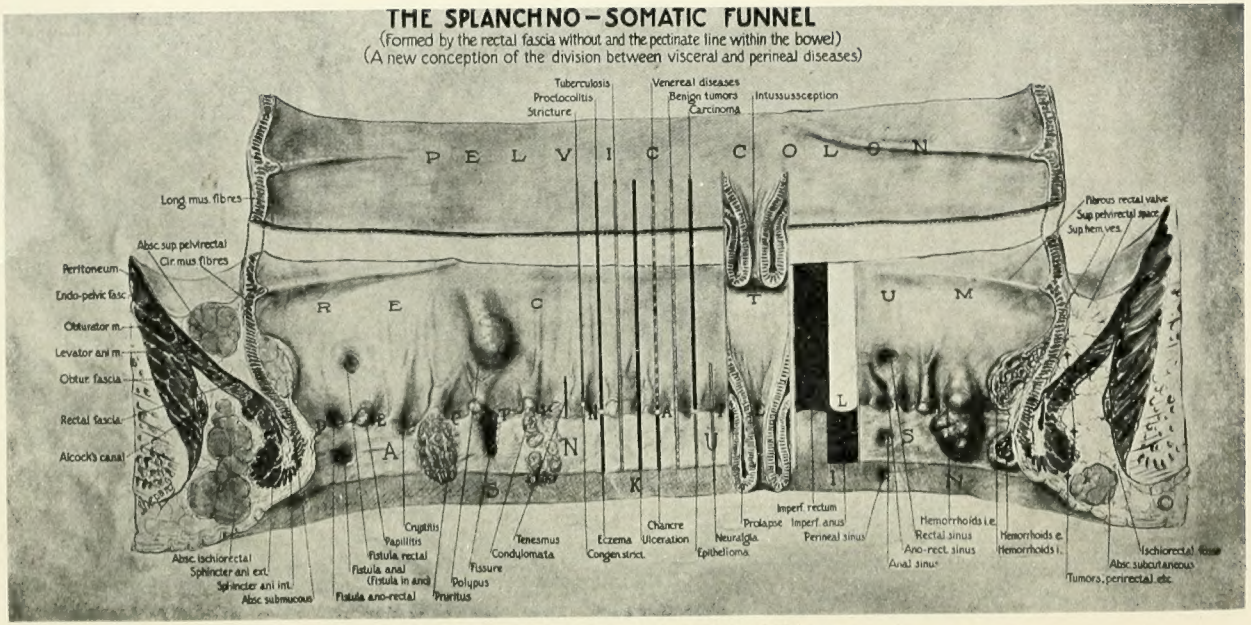
American Proctologic Society

TWENTY-FOURTH ANNUAL SESSION



The Topography of Rectal and Anal Diseases.

(From *Rectum, Anus and Pelvic Colon* by J. R. Pennington, Phila. 1923—Courtesy of P. Blakiston's Son & Co.)

TRANSACTIONS

OF THE

American Proctologic Society

TWENTY-FOURTH ANNUAL SESSION

HELD AT HOTEL ALEXANDRIA, LOS ANGELES, CALIF.

JUNE 22ND AND 23RD, 1923

NEW YORK

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FOREWORD

The innovation attempted last year in the publishing rather than the mere printing of the TRANSACTIONS has met with gratifying success. We feel that the greatly increased publicity for the American Proctologic Society through press notices, book reviews and quotations from the TRANSACTIONS justifies the change that was made. Moreover the volume is now listed in publishers' catalogues and thus takes a permanent place in medical bibliography.

The present committee therefore felt confident of the Society's approval in continuing the above outlined policy.

JOSEPH F. SAPHIR, Editor
JOSEPH F. MONTAGUE,
Publication Committee

CONTENTS

PAGE

DATA OF THE AMERICAN PROCTOLOGIC SOCIETY vii

PRESIDENTIAL ADDRESS ..... *Dr. Emmet H. Terrell, Richmond, Va.* 1

SOME ADMONITIONS, SUGGESTIONS, AND CRITICISMS 5
Dr. Joseph M. Mathews, Seattle, Wash.

CIRCULAR AMPUTATION FOR MARKED FIRST AND SECOND DEGREE PROLAPSE OF THE RECTUM 10
Dr. Frank C. Yeomans, New York, N. Y.

AN ORIGINAL BACTERIOLOGICAL RESEARCH OF PRURITUS OF THE PERINEUM 16
Dr. Joseph F. Montague, New York, N. Y.

SACRAL ANESTHESIA IN PROCTOLOGIC SURGERY 35
Dr. Alfred J. Murrieta (non-member), Los Angeles, Calif.

ANORECTAL OPERATIONS UNDER LOCAL ANESTHESIA 41
Dr. Joseph F. Sapbir, New York, N. Y.

THE AMBULANT TREATMENT OF ANORECTAL FISTULA 49
Dr. Arthur C. Crookall, Seattle, Wash.

POLYPS OF RECTUM AND LARGE BOWEL 57
Dr. Charles E. Howard, Cincinnati, O.

CASE REPORT; TUBERCULOSIS OF ANUS AND RECTUM 61
Dr. William M. Beach, Pittsburgh, Pa.

THE TOPOGRAPHY OF RECTAL AND ANAL DISEASES 67
Dr. J. Rawson Pennington, Chicago, Ill.

A STATISTICAL REVIEW OF CARCINOMA OF THE RECTUM, RECTOSIGMOID AND SIGMOID ..... *Dr. Louis A. Buie, Rochester, Minn.* 71

AN ORIGINAL TREATMENT FOR RECTAL STRICTURE 81
Dr. E. Jay Clemons (non-member), Los Angeles, Calif.

CLINICAL PROGRAM 84

INDEX 87

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DATA OF AMERICAN PROCTOLOGIC SOCIETY

FORMER OFFICERS

1899—The Society was organized and held its first meeting at Columbus, Ohio—June 6th and 7th. Dr. J. Rawson Pennington, of Chicago, Ill., called the meeting to order and stated the objects and purposes for which the meeting had been called. He then placed in nomination for temporary chairman, Dr. James P. Tuttle, of New York, N. Y. Dr. J. Rawson Pennington was elected temporary secretary. Dr. Thomas C. Martin, of Columbus, Ohio (now of Washington, D. C.), and Dr. William M. Beach, of Pittsburgh, Pa., were appointed a committee to draft the Constitution and By-Laws.

1899–1900—Washington, D. C.—Joseph M. Mathews, M.D., President; James P. Tuttle, M.D., Vice-President; William M. Beach, M.D., Secretary-Treasurer.

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TWENTY-FOURTH ANNUAL SESSION

OF THE

American Proctologic Society

HELD AT

HOTEL ALEXANDRIA, LOS ANGELES, CALIF.

JUNE 22ND AND 23RD, 1923

The American Proctologic Society

ITS OBJECT SHALL BE THE CULTIVATION AND PROMOTION OF KNOWLEDGE IN WHATEVER RELATES TO DISEASES OF THE RECTUM AND COLON.

Article II *of the Constitution.*

PRESIDENTIAL ADDRESS

EMMET H. TERRELL, M.D.

RICHMOND, VA.

Fellow Members of the American Proctologic Society, and old friends, to one and all I bring greetings.

I call you old friends advisedly, for had I not your friendship and confidence, I would not today be presiding over this distinguished gathering. I think it was Horace Walpole who said: "Old friends are the greatest blessing of one's later years. Half a word conveys one's meaning. They have a memory of the same events, and have the same mode of thinking."

That is particularly true of the friendships that we have formed in this body. It has been thirteen years since I was honored by being made an associate fellow of this Society. I had been permitted to attend some of your meetings previously, as a guest, and hence could appreciate the value of an association with you.

At that time I was just beginning the study of rectal diseases, and, while I did not then comprehend all that was said, yet the sincerity and earnestness of your members made a most favorable and lasting impression upon me. The discussions were always liberal, and at times spirited. Contrary to the custom prevailing in other medical societies, it was noticeable that even the most excellent papers received few bouquets at your hands. On the contrary if a statement was made, which did not ring true in every respect, the author was subjected to severe, and at times, apparently unfriendly criticism. In other words a speaker dared not make a statement which he was not prepared to back up.

In my opinion, the sincerity and frankness, and, at the same time, the true friendliness of the early members of this Society to each other, have had much to do with its success. I am happy to state that this same spirit has continued without abatement throughout all these years. Also, the younger members, with few exceptions, have shown the same earnestness that characterizes the old guard.

To have been chosen to preside over a body of enthusiastic workers and good fellows, as you are, is an honor to which I had not dared aspire.

As to my appreciation of this honor, the confidence and trust you have reposed in me, I can only say with Charles Lamb, "If words came as readily as ideas, and ideas as feelings, I could say ten thousand kindly things." I believe you understand me.

The members of this Society have seemed constantly hungry for new ideas, as only true scientists can be. This, in a word, is the reason why, year after year, we see the same familiar faces at these meetings. No doubt it is at a great personal sacrifice that some of you come long distances each year to attend these sessions. While there has always existed the warmest personal feeling of friendship among you fellows, it is not sentiment alone that brings you so regularly together. Although you have devoted the best years of your lives to proctology, you realize that there are yet problems to be solved, and that the place to clear up these difficulties is here, face to face with each other. If the truth were known, many discoveries of importance have resulted from the meager suggestions of others. It matters not how proficient he may be, no member of this Society can afford to be absent from its meetings.

If you will look over the list of attendants for the past few years you will see that the busiest men have been the most regular. Personally I have always felt repaid for the time spent and the expense incurred on these trips, and have ever returned to my work with the feeling that I was a better proctologist than before I came. Furthermore, I seem to get an inspiration and renewed interest in my work from these meetings, which help to carry me through the coming year. One needs to be tuned or keyed up once in a while in order to do his best. When a physician becomes satisfied with himself he usually ceases to prosper, for it is an invariable law of nature that when progress stops retrogression takes place.

It is a pleasant duty to welcome you to this twenty-fourth annual meeting of the Proctologic Society. Since its organization we have met regularly each year, with the exception of the year of the great World War. This is our second meeting in Los Angeles, the one previous having been held here twelve years ago. We are truly grateful to Dr. Kiger for the invitation to come once more to this beautiful city, and also for the most excellent program of clinics which has been provided.

Los Angeles was for a number of years the adopted home of our first President who has done more for proctology than any one else. He is familiarly known to us as the "Father of Proctology" and he well deserves the title. He it was who blazed the way that we might follow. We can imagine this was no easy task in those days of skepticism, but, through perseverance, energy and unlimited optimism, he overcame the

difficulties one by one, as he met them, and finally rose to a position of preeminence and honor. We are proud to be the disciples of such a truly great man. Throughout the ages and until the end of time we shall honor and revere the name of Joseph M. Mathews. His life and work bring to mind the oft quoted gem of James Russell Lowell:

> The longer on this earth we live
> And weigh the various qualities of men,
> The more we feel the high stern featured beauty
> Of plain devotedness to duty.
> Steadfast and still, nor paid with mortal praise,
> But finding amplest recompense
> For life's ungarlanded expense
> In work done squarely, and unwasted days.

For many years, because of the indifference of the medical profession, the name "rectal specialist" carried with it the stigma of the charlatan or quack. Beginning with the efforts of Dr. Mathews, and later through the work of other members of this Society, the speciality now holds as honorable a place as any other branch of medicine and surgery, although as yet the advertising quack is not entirely eliminated.

Ours is one of the few divisions of surgery not overcrowded. In all the larger cities, such as New York, Boston, Chicago and Philadelphia, will be found several men devoting their time to the treatment of rectal diseases, but in proportion to the population, there does not seem to be a sufficient number of these men anywhere to care adequately for the work. There are many large communities, and even states, in which a proctologist, worthy of the name, is not to be found. Any well-to-do section of 100,000 population, or even less, will furnish an abundance of work of this nature for a deserving and capable man.

It is probably true that where the superior worth of the specialist is not known, and where it has not been customary to refer these cases to him, some educational work will be necessary before he becomes thoroughly established. This of course will take time, as may be expected in any new undertaking. In order that our chosen line of work may receive further recognition in parts where it is unknown, and also for the benefit of the many sufferers from rectal diseases (and they are everywhere) we should encourage young men of ambition and integrity, after preparation in rectal surgery, to locate in sections where they are most needed. No one need fear a little additional competition. There is an axiom in business which says: "Competition of the right sort helps business." This applies to the professional as well as the business man.

It seems to me that we have been derelict in one phase of our work, and that is in not calling sufficient attention to the relation of rectal

diseases to systemic affections. Medical literature for the past few years has been crowded with articles dealing with the effects of infection in the mouth, the tonsils, the genitourinary tract, in fact few parts of the body have been overlooked. Rarely, however, have the authors considered at all the influence of anal or rectal diseases on the system as a whole. Even such an authority on focal infections as Frank Billings devotes less than five lines in his book to this phase, and dismisses the subject by simply stating: "The rectum, with its rich supply of hemorrhoidal veins, becomes a focus of infection, through ulcers, infected thrombi in veins and local abscesses." Such a statement has little significance, and, of course, by no means covers the ground. The most comprehensive paper on the subject which I have seen, has been from the pen of Dr. Horace W. Soper, of St. Louis. Dr. Soper seems to have an unusually clear idea of the relationship of infections in the lower intestinal tract to systemic diseases. I do not believe that every disease of the rectum is a focus of infection, in the sense that there is sufficient absorption from it to cause grave constitutional symptoms, although I am convinced that this does frequently occur. Indirectly, however, the effects are often as fully pronounced. Take, for instance, a fissure in ano, one of the commonest diseases of the intestinal tract. I think there must be but little absorption from such a condition and yet the patient with a fissure soon becomes constitutionally sick in one way or another. As in chronic appendicitis or cholecystitis there is an interference with metabolism and peristalsis is retarded, with an incomplete elimination of the intestinal contents. Call it autointoxication or not, as you choose, constitutional treatment of such a condition has but little effect. The physician doing general practice has had little opportunity to observe the frequency and significant importance of these apparently minor lesions. Whose business is it but ours to inform him of these facts, as we see and understand them? We have been remiss in our duty to the profession and to mankind. Allow me to suggest that we write more along these lines.

It is my opinion that we should seriously consider the advisability of reestablishing the *Proctologist* or some other journal for the publication of our papers and other matters pertaining to our specialty. You will recall that a very worthy periodical was edited for many years by Dr. Rollin H. Barnes of St. Louis, but was discontinued after his death because no one could be found willing to assume the responsibility of leadership. There are at this time several men among us capable of doing this work in a creditable manner, and I have no doubt that one or more of them could be induced to assume these duties, if assured the proper support from the Society. I simply offer this as a suggestion, but believe

that it should receive careful consideration by a committee appointed for that purpose.

Another suggestion is that some one should be designated to make a digest of the current literature appearing during the year, and that the same be read at the annual meetings. This, you will remember, was done for many years by Dr. Samuel T. Earle, and was a most interesting and instructive part of our program. Short synopses of articles containing new and original ideas pertaining to diseases of the intestinal tract should be made. A publication of these in the proceedings of our meetings or in a Journal, if one be established, would be of material value to us.

I thank you each and every one for the kindly attention you have given me, but still more for the loyal support you have given me as President of your Society.

I have appreciated the honor and enjoyed the service, for after all is said and done there is no surer road to happiness or to success, than sincere service to one's fellowman. With this thought in mind, I close with these beautiful lines from Robert Louis Stevenson:

"When we look into the long avenue of the future and see the good there is for each of us to do, we realize, after all, what a beautiful thing it is to work, and to live, and be happy."

SOME ADMONITIONS, SUGGESTIONS AND CRITICISMS

JOSEPH M. MATHEWS, M.D., LL.D.

SEATTLE, WASH.

Being the oldest man here and the first president of this Society and the originator and founder of the specialty of proctology, I believe that you will permit me to offer a few friendly "Admonitions, Suggestions and Criticisms." If they do not meet with your approval, you have only to cast them in the waste basket, and consider them unsaid.

Let me refer to the name that you have approved, and affixed to be used by each member to designate his specialty and used in rendering this your national body distinct from other special societies, namely: Proctology and Proctologist. I was not present when this name or title was determined upon. Had I been, I state frankly that I would have opposed it. It therefore becomes my duty to tell you my reasons. I would have contended that, being a new specialty, unknown to either the medical profession or the laity, it would have been best to simplify its name as much as possible. For instance, a member wishing to an-

nounce his specialty on his professional cards (a thing fully authorized by the American Medical Association) would say that he limited his practice to the "Diseases of the Rectum and Colon" then each physician, and layman as well, would know what it was. Under the name you have adopted much confusion has been aroused for the reason that but few know the meaning of proctology. Nor can they learn this easily by instituting a search, for the word is not to be found in dictionaries except those of recent date. You may say in answer that the word explains itself, but let me remind you that you are not appealing to a limited few of highly educated persons, but to the great mass of people of ordinary or common school education. Many, very many, of your patients, I might add your best patients, come from the farming districts. Perhaps you will say that any one following this specialty can put my suggestion on his card if he so wishes. But do you not think that he would be a little diffident in doing so after he has been admitted to the membership of the Proctologic Society? You may say that I am mistaken, and that you are sure that our profession at least, fully understands the meaning of the name you have adopted. If you think so, when you return home, give it a test by first asking your professional friends to define the term, and then asking the laity, even those under your care and treatment, what your specialty is. I will abide by the answers you receive. I attended a dinner recently at which one hundred prominent business men sat. A member of this Society was introduced as a *rectal specialist*, and was acclaimed as a man of distinction. The member was none other than myself and I was proud of the distinction.

A young man, a member of this Society, said to me very recently that he was handicapped in his specialty because scarcely anyone knew what his specialty was. There are few other specialties that are so hampered. Those who give special attention to diseases of the stomach are known as stomach specialists; to the heart, as heart specialists; to the respiratory organs, as lung specialists; to the brain, as brain specialists. Gynecologists are better known as abdominal specialists; the genito-urinary surgeon as the name implies; the obstetric specialist as obstetrician, and so on. Indeed, I know but few if any specialty that is so hid under a bushel by its name as is ours, save one and that one is the "ology" used by gentlemen who extract teeth. The name is so long and confusing that I will have to admit—as many a one would probably have to admit if asked what *your* specialty was—"I don't know" or "I have forgotten it."

Now, gentlemen, allow me to ask, are you hewing to the line in your specialty? What is the meaning of the word, if not that you specialize or limit your practice to the organs or diseases which you have desig-

nated to the people, and to your professional brethren. If you are not so limiting your practice, are you really a specialist? If you are infringing upon other specialists, can you blame other specialists for encroaching on yours. If you open the abdomen to remove a tumor, can you blame the abdominal specialist for removing a tumor from the rectum. If you divide a stricture of the urethra, can you oppose a genitourinary specialist in dividing a stricture of the rectum; if you remove a kidney, adjust a fractured bone, or extract gallstones, can you expect the general surgeon to refer any special cases in your line to you? The whole list of specialties is built upon a generous reciprocity. You must not expect favors, when you do not grant any. Possibly you think the specialty that you have embraced is too limited in work. Why did you join or adopt it if such was your opinion? But is the field so limited? On the contrary, I assert that it is one of the widest, and embraces as much, if not more, than the majority of specialties. I claim that the man who treats and operates on the diseases of the rectum and colon, and only these, will be and is the busiest of specialists. Let us at least keep our skirts clean. Consider the field with me: I need not recount the number of diseases that affect the anus and rectum for each and all of you are familiar with them, though the general surgeon, and often the laity, seem to think that piles and fistulae constitute all of your work. Well, I again say that they alone are sufficient to make up a specialty and if any one man could secure all these cases in any city, his financial condition would be assured and he would be the means of relieving patients of more pain and distress than would many men in other specialties. I know of two men that went from my office and established themselves as specialists in this line, who never operated upon any pathologic condition above the rectum proper, both of whom had a very large practice and an abundant income from it. I know another physician who became proficient in rectal surgery but concluded to adopt general surgery along with it. He is forgotten today as a specialist and his general surgery does not pay him in dollars and cents as much as either one of the gentlemen who operate, for rectal diseases only. You can gather the lesson I am trying to teach here if you will think for a few moments. If there are members here who do not wish to do capital operations on the colon, or above the rectum, they are entirely safe in reputation and financial receipts. To those who desire to embrace *all* the work that the specialty guarantees, I would beg to submit a list of the surgery that can be done and yet not overstep the line that divides it with other specialties: Colostomies, cecostomies, prolapse and adhesions of the pelvic colon, adhesions of the appendix, or cecum, dilation of the cecum, incompetency of the ileocecal valve, adhesions which obstruct

the colon, by compression or by constricting it, prolapse of the rectum (colopexy), prolapse of the colon, resection of the rectum (stricture and malignancy), resection of the colon (malignant), benign growth of colon, and lesions of the colon which produce mechanical obstruction.

Then as Kellog points out, the transverse colon has no fixed position and the omentum may adhere to any inflamed surface and therefore call for surgical procedure. While speaking of the colon let me emphasize the statement already made: Do not remove the colon for any supposed good that such an operation would do your constipated patient.

Then, gentlemen, I ask you in all candor, is not this long list of surgical affections that I have named quite sufficient to appease your surgical appetite? Each and all of them belong to the specialty of proctology whether you wish to embrace them or not. Why should you desire to interfere with or encroach upon any of the other specialties? The general surgeon will acknowledge your rights as a rectal and colon specialist to pursue these operations along the whole route of the colon, but will deny you the right in the name of justice to remove a kidney, operate upon a uterus, extirpate a gland, or do many other surgical things which justly belong to him.

If may be questioned if the proctologic surgeon should at any time remove the appendix. Some do, others do not. Anatomically he has the right, as a question of policy I must leave that entirely with you.

This paper has been nearly entirely devoted to the consideration of the surgical aspect of our specialty but before closing I wish to impress upon you the need for your most careful attention and consideration of serious conditions, especially in the colon, which do not require surgical treatments, but are of just as much moment as if they did, idiopathic disease, if I may use the term in this connection. Of course you are familiar with the inflammatory processes that bring about such conditions as colitis, enteritis, proctitis and the ulcerative conditions; the result of special diathesis as tubercle and cancer. I might include diarrhea, especially *Amoebae dysenteriae*. To these you should give as much attention as you do to your surgical conditions. It is not, however, to these in particular that I wish to draw your attention, but to a more common affection, constipation.

We must not leave to others the solution of the problem of constipation with its long train of symptoms following in the wake of autoinfection and autointoxication which by its very insidiousness wrecks so many bodies. It properly belongs to you and is a subject which requires much thought and investigation. I do not refer to the surgical aspect of this condition but to the proper treatment of it as a physiological manifestation. It is the bane of our specialty and the people look to you

for relief. It is the one condition over which there will be no quarrel for precedence as both the internist and the surgeon will yield possession of it without discussion, for it is a hard nut to crack. Let me beseech you then to encourage the reading of a paper or papers at each meeting on this very important subject.

You, as a Society, have accomplished much. You have made yourselves known among men. The medical profession acknowledges your merits. They have called you into their council by establishing you as a section in the American Medical Association and that body stamped its approval of your specialty when it elected one of your members as its president to preside over its deliberations. The Army evidenced its opinion of you when its Surgeon-General called many of you into the field, commissioned as important officers in its corps. You served with distinction across the waters in France and England. You should be proud of yourselves, of your specialty and of this Society. It goes without saying that I am proud of you—*my* children.

Now before closing, I feel like apologizing for addressing you more like a father who admonishes his child, than as a member talking to the other members of this Society. I have reminded myself of the days when I lectured to the student body at the medical college in which I had the honor to appear as teacher. But I know that you will forgive me for any breach which was not intended on my part. I am called by some of you the "Father of Proctology." Well then has not a father the right to spank his own offspring if he so desires? It may be that I will not have the pleasure of meeting with you in this Society again. This old heart of mine which has done faithful duty for over seventy-six years has given me positive warning several times that it is growing tired of its job. Mayhap it will cease to beat ere I see you again and I will have passed with the shadows without the chance of bidding you adieu. If it be so I want you to know that above all things else I have gloried more in the establishing of your, of my specialty, than of any other honor or achievement that has come to me in life. I know that long years after I am gone this specialty will still live and hundreds, yea thousands, of afflicted humanity will bless each one of you for the relief from pain and distress. Let me hope that each of you may have a long and successful career. After you have rounded out your three score years or more, may you then have a few blissful days in which to review a life that has been filled with honors justly earned. And may God hold each one of you in the hollow of His hand!

CIRCULAR AMPUTATION FOR MARKED FIRST AND SECOND DEGREE PROLAPSE OF THE RECTUM

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Three degrees of complete prolapse of the rectum or procidentia recti are recognized clinically. In the first degree the prolapse begins at the anal margin. Second degree prolapse begins at some point above the anus, the bowel protruding a variable distance externally. This type can always be recognized at once by feeling a sulcus between the protrusion and the anal canal. Prolapse of the third degree is virtually an intussusception of the sigmoid into the rectum but not through the anal orifice, so there is no visible external protrusion. Complete prolapse of whatever degree is, after all, an invagination of the rectum or rectum and sigmoid, through the anal canal in first and second degree procidentia, and above it in prolapse of the third degree.

Many theories of the causation of prolapse of the rectum have been advanced, any one of which may explain in some degree an individual case, but none of which will explain satisfactorily every case. The truth probably is that usually a number of elements enter into the etiology, the combined effect of which produces the prolapse. Broadly speaking, congenital or acquired mobility of the rectum and whatever causes relaxation of its supports—muscles, fascia, ligaments, peritoneum and vessels—are the basic factors of procidentia. "The passive supports, composed of fibrous and elastic tissue, lose their elasticity through gradual elongation or rupture; the active supports, composed of muscular tissues, lose their elasticity through atrophy, injury or paralysis" (Tuttle). In large prolapses the *cul-de-sac* of Douglas certainly descends but it is debatable whether this is the primary cause of the prolapse, as is claimed by some investigators, or whether it is secondary, as is more probable.

Factors predisposing to prolapse are a congenitally weak fixation of the bowel; chronic debilitating diseases; spinal cord disease, more often observed in men; a solitary polyp of the rectum or lower sigmoid, acting as a foreign body; organic stricture of the bowel, and in women, neglected perineal lacerations and hysterectomy with poor repair of the pelvic diaphragm.

The chief exciting cause is the repeated pressure of straining, as in chronic constipation or heavy lifting; irritation of the bowel mucosa; enlarged prostate with tenesmus, or the frequent coughing of chronic

bronchitis. Hence, recurrent and persistent prolapse occurs most frequently in advanced age when the supports of the rectum, especially the muscles, have lost their tonicity and the factors of strain have become operative.

Symptomatology of first and second degree prolapse shows at first only slight protrusion, occurs only at stool and is reduced spontaneously. In the course of time the procidentia becomes larger and must be reduced by hand. Eventually the anal sphincters become so relaxed that the reduced prolapse recurs at once after reduction or as soon as the patient moves about. In certain cases the bowel finally remains permanently extruded, due to adhesions and other causes, and cannot be replaced. In these constantly recurring and irreducible cases, congestion and hypertrophy of the mucosa ensue, and later induration and ulceration, with discharge of mucus, blood and pus. Often the state of the patient is pitiable and elderly people, in whom this condition most often occurs, can neither sit nor walk but become confirmed invalids, confined to bed with vesical and rectal incontinence.

This is the usual course of large, chronic, recurrent and irreducible cases of prolapse. There are, however, certain instances of acute prolapse of the first and second degree, usually due to accident or injury, which present quite a different history. In these the intact functioning sphincters grasp the suddenly extruded bowel tightly, the return circulation is impeded and gangrene may follow unless prompt relief is obtained.

For the correction of marked chronically recurring or irreducible prolapse of the first and second degree, many ingenious operations have been devised, some of them depending upon the surgeon's theory of their causation. Mikulicz[1] proposed circular amputation for certain of these cases and I will recite three instances in which I successfully performed this operation.

Case I. Mrs. M. J., aged seventy-one, was the mother of four children. The first delivery was by forceps and the perineum received a third degree laceration which was repaired imperfectly. Prolapse of the rectum began seventeen years before admission to the Central Neurological Hospital in December, 1921. At first the procidentia was small but grew progressively larger and during the past two years had been constantly protruded.

Physical examination showed an emaciated old woman, apparently not very ill, confined to bed with chronic bronchitis, incontinence of urine and feces, and a prolapse of the rectum. The procidentia was of the first degree and about five inches in length, as indicated by the

[1] Mikulicz, J. *Deutsch. Gesellsch. f. Chir.*, Bd. xvii.

illustration (Fig. 1). Its mucosa was superficially ulcerated. After reduction the prolapse recurred almost immediately, even while the patient was still recumbent. The uterus was atrophied and its cervix flush with the vaginal wall.

She was operated on, December 16, 1921, under gas and ether anesthesia. Lithotomy with moderate Trendelenburg position on the table was employed to favor recession of the small bowel from the pelvis. Under antiseptic precautions a circular incision, one inch from the anal verge, divided the outer coat of the prolapse through the mucosa. Bleeding points were caught and tied. The incision on the anterior

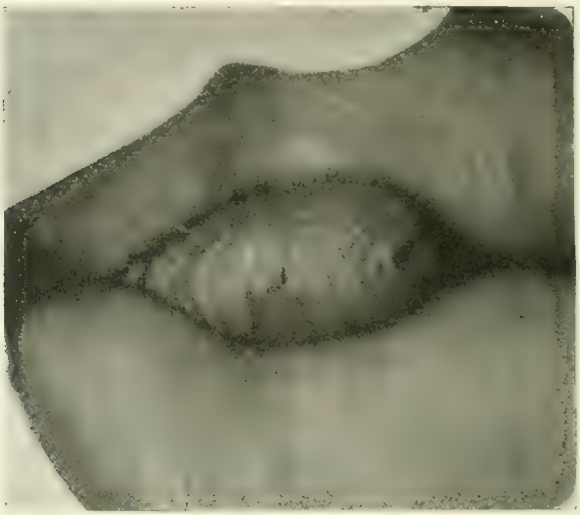

FIG. 1.

surface was then deepened through the bowel wall, opening the cul-de-sac. The distal cut segment was then rolled out, freely exposing the intussuscepted sigmoid. The latter was held with Allis' forceps and divided transversely on a plane with the first incision. The entire thickness of the wall of the sigmoid was cut through at first on its anterior surface 1 cm. at a time and immediately united to the rectum by a through-and-through suture of chromic gut until the peritoneal pouch was completely closed. The remaining extraperitoneal portions of the rectum and the sigmoid were then quickly amputated through the same plane and the anastomosis completed with through-and-through sutures. As the inner tube (sigmoid) was only about one-half the diameter of the outer (rectum), the posterior gap in the latter was

closed by a continuous suture. A tube was introduced about six inches through the anastomosis which was then reduced. It receded about 3 cm. and iodoform gauze was packed lightly about the tube over the line of suture. The patient reacted well from the operation and the sutures held. Eleven days later only granulations marked the line of anastomosis. The bowels were acting daily and the patient had regained control of her bladder. Unfortunately this patient developed broncho-

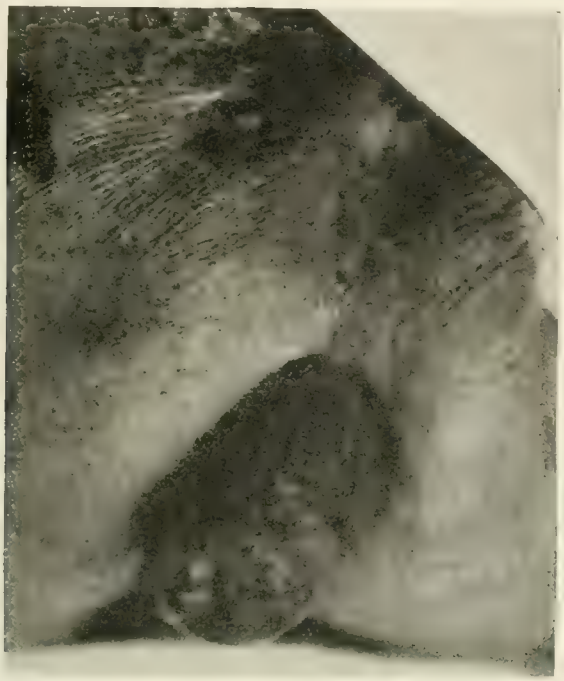

FIG. 2.

pneumonia three weeks after operation and succumbed in a few days. The anesthetic used should have been gas and oxygen or, preferably, sacral anesthesia with sacral nerve block.

CASE II. J. McC. was a widow, aged seventy-five years. She had no children, and had always enjoyed good health except for her present complaint. This began five years before her admission to the hospital on December 9, 1922. The prolapse began gradually and at first could be replaced but later tended to recur and now is permanently protruded, so that the patient is comfortable only when recumbent.

Positive findings on physical examination were chronic bronchitis, a systolic heart murmur, extra systoles, arteriosclerosis incontinence

of urine and feces and a complete first degree prolapse of the rectum. The procidentia was four and one-half inches in length (Fig. 2), its mucosa was thickened and in a few areas, ulcerated and could not be reduced.

The operation was performed on December 29, 1922. In view of the chronic bronchitis and heart condition, sacral anesthesia was employed, two ounces of 2 per cent novocaine being injected into the sacral canal.

The technique of circular amputation, as proposed by Mikulicz, was then carried out as described in *Case I*, except that in dividing the sigmoid obliquely the ends were approximated accurately without any redundance of the outer coat (rectum). Unfortunately the bowels acted on the second day, so daily irrigation with normal saline solution was necessary. The anastomosis healed kindly, without peritoneal infection. Sixteen days after operation control of the bladder and rectum was regained. I examined this patient four months after operation. The result was excellent, anatomically and functionally. The bowels were acting twice daily with perfect control; urination was normal. At the upper margin of the anal canal there was a linear, annular scar having the caliber of a No. 6 Wales bougie.

Case III. W. G., a man, aged sixty-eight, had protrusion at stool for many years and during the year before consulting me the bowel was more or less constantly out. Examination showed his general condition to be good except for a reducible prolapsus recti of about two and one-half inches and a sulcus between the anus and protrusion, thus constituting a second degree prolapse.

On May 19, 1923, I did the Mikulicz operation as described, with the difference that the peritoneal cavity was not invaded. Healing was prompt and the anatomical and functional result excellent.

Tuttle[2] states: "The conditions which seem to justify amputation are: The existence of neoplasms involving the entire thickness of the gut wall, organic strictures, gangrene or sloughing of the protruded gut, and adhesions such as prevent reduction." Tuttle entertained grave fears of peritonitis from opening the *cul-de-sac* during the operation or the subsequent giving way of the line of suture. With thorough antisepsis and careful technique, it seems to me that the liability of infection is minimal. One fact, too, is certain, that in a case of chronic prolapse, hypertrophied and ulcerated or irreducible from adhesions, no other type of operation is feasible. Laparotomy in any one of the three cases cited would almost certainly have ended fatally.

The operation itself is relatively simple, there is very little hemorrhage and when performed, as it should be, under gas-oxygen or pref-

[2] Tuttle, J. B. Diseases of the Anus, Rectum and Pelvic Colon, p. 699.

erably sacral anesthesia, there is practically no operative shock. This is a factor of prime importance when operating upon debilitated individuals.

DISCUSSION

Dr. D. C. McKenney, Buffalo, N. Y.: Of the cases in which I have done circular amputation of the rectum I recall two, in one of which I did a second amputation; and, in both cases the only way I got a satisfactory final result was by resorting to the Moschcowitz operation. The abdomen was opened and the rectovesical pouch was obliterated from the bottom upwards. In both instances this method cured the prolapse.

Dr. J. Rawson Pennington, Chicago, Ill.: By means of the usual sigmoid fixation method with slight modification I have successfully operated on a number of cases of rectal prolapse. The modification consists in either dissecting the serosa from the muscular band or scarifying it, then splitting the left lateral parietal peritoneum and dissecting it from the fascia and sewing the denuded muscular band to the exposed fascial surface, thus bringing the two denuded areas together. Adhesions which hold the bowel in position seem to take place between the denuded areas.

Dr. William M. Beach, Pittsburgh, Pa.: I think we should conceive the etiology of prolapse of the rectum as a type of hernia passing through and involving the pelvic fascia much as an inverted cone. When the ligaments become relaxed by successive attempts at prolapse the intra-abdominal pressure increases its aptness toward prolapse.

As to the treatment: I do not know whether any of the rest of you have ever tried the following scheme or not. After reading Dr. Tuttle's paper I conceived the idea of doing a three-step operation of removal of the sigmoid flexure. That operation might be applicable to this condition. In one case I tried it with success, doing a three-stage operation, establishing a temporary artificial anus and cutting off that portion of the bowel which protruded from the wound, and then subsequently closing the aperture. In this particular case it cured the prolapse.

Dr. Ralph W. Jackson, Fall River, Mass.: In 1917 I read a paper before this Society, in which I reported two cases of major rectal prolapse in adults with the results of treatment. In one I tried without success practically every other surgical procedure, including amputation, before I did a Moschcowitz operation, which gave a permanent cure. In the other I resorted to no other procedure, but did a Moschcowitz immediately, and got a permanent cure. The sharp contrast in these cases between the poor results of other procedures and the good results of the Moschcowitz was so marked, that I was lead to the conclusion that, as Moschcowitz claims, the pathological condition is essentially a hernia, and I have never seen any reason since to believe that his operation is not the one of first choice in major types of rectal prolapse, in adults at least. In such cases when the Moschcowitz fails, and in such a rectal prolapse as we saw in the child at the hospital this morning, there is undoubtedly a field for circular amputation. This operation, however, practically always involves opening the cul-de-sac in front of the rectum, for it is so deep that it cannot be avoided. It is my custom, in all such cases, not to close the peritoneum completely, for I feel that the operative field in that neighborhood can never be rendered absolutely sterile, and that peritoneal infection is more than probable,

and therefore I have inserted a temporary cigarette drain, which is removed within forty-eight hours. I can see no harm in this, and it has not interfered with the results in any way. I would like to ask Dr. Yeomans whether he puts in such a temporary drain.

Dr. William H. Kiger, Los Angeles, Calif.: Last winter, one of our members, Dr. S. G. Gant operated for us at the County Hospital, one of the largest prolapses I have ever seen. The operation he did was a new one to me. The prolapse was drawn down and a wide cuff of mucous membrane removed. The rectum was shortened by plicating the musculature with two or more rows of catgut sutures. Proximal and distal edges of mucosa were approximated and a sigmoidopexy was done. There was also a V-shaped piece of tissue removed from the posterior wall of the anal canal. The result was very satisfactory in this case.

Dr. Yeomans (closing): The few cases of this operation I have reported illustrate a type of prolapse of the rectum in people who, on account of their advanced age or other controlling reasons, could not stand a laparotomy. The Moschcowitz operation for prolapse of the rectum is excellent for those patients who can stand it.

I have done many ventral fixations, and I have seen many of these patients long after the operation. This operation, properly performed, retains the bowel in the position where it is fixed, but results are uncertain. Some patients are relieved, others are not, while a number of them have a "drag" of the abdominal wall where the gut is attached. There is also an objection to the operation on the ground that the small intestine might become strangulated about the attached loop. I do not know that this has occurred, but it is a possibility and should be avoided if we can get the result by means of some other operation.

Of course, prolapse of the rectum in children is a thing entirely different from prolapse in adults. We have had a number of cases of prolapse of the rectum in children older than the case we saw this morning in Doctor Kiger's clinic in which sigmoidopexy was performed. While this works very well in children, it is not usually successful in adults. There are so many different ways of treating prolapse of the rectum that we have to individualize our cases and be familiar with the various methods in order to adapt the operation to the particular case.

AN ORIGINAL BACTERIOLOGICAL RESEARCH OF PRURITUS OF THE PERINEUM (PRURITUS ANI, VULVAE AND SCROTI)

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Of the many theories which have from time to time been offered in an attempt at explanation of this malady none has been more alluring than that it is due to bacterial invasion. This possibility was first asserted by Murray who believed he had found a specific causative organism, a strain of streptococcus which is known to bacteriologists as the Streptococcus fecalis. For some years he contended that here

was the long sought for primary etiological factor and by his persistent reports won many adherents to his views. At present this theory has been largely discarded partly because of lack of evidence as to the pathogenicity of Streptococcus fecalis and partly for the reason that vaccine treatment based on the use of Streptococcus fecalis is totally unsatisfactory.

More recently J. M. Winfield[1] in presenting a review of cases concludes that 80 per cent "had an infection of the skin covering the affected parts caused either by the colon bacillus or the Streptococcus fecalis or by both together. In 100 per cent of these infected cases the colon bacillus "was obtained from the exudate" and in 75 per cent the Streptococcus fecalis was demonstrated." The same author reports eight cases in which the epidermophyton fungus was a cause.

Such a statement, regarding the demonstration of infection, lays Winfield open to the same criticism I make of Murray; i. e., that no such infection can be assumed on the basis of the proof offered. While I am reasonably sure, because of my pathological studies of the tissue in this region,[2] that infection does occur in a certain percentage of cases, yet my researches do not support such a statement nor does clinical experience warrant classifying four-fifths of all cases as infective. With the present elevation to public interest of the B. acidophilus it can be safely predicted that this too will be shortly found as the cause of infection in nearly 100 per cent of the cases also. Or perhaps, if not the B. acidophilus, then some other bacteria normally present on the normal anal mucosa which can, when guided by desire and suitable media, grow in 100 per cent of all cases. The fact that colon bacilli and a strain of non-pathogenic chain growing diplococci are normal residents of the area under investigation did not seem to enter the consideration of either Murray or Winfield, nor influence their judgment as to pathogenicity.

With the idea, however, of ascertaining to what extent the findings of Murray and of Winfield could be corroborated, I initiated in 1918 and later in 1921 and 1922, a series of bacteriological examinations along similar lines. The technique described in detail below was made to conform with Murray's, the only modification being a serious attempt to avoid contamination during the taking of the culture and a more detailed analysis of the cultures obtained.

The cases subjected to this examination were in all forty-four; twenty were cases of rectal disease in which pruritus of the anus was absent and fourteen cases in which it was present, without other ano-

[1] Winfield, J. M. (*Arch. f. Dermat. u Syph.*, iv, 680, November, 1921).

[2] Montague, J. F. Etiology and Pathogenesis of Anal Pruritus and Pruritus Ani. *N. York M. J.*, cxvii, viii, 469.

rectal pathology. In addition, five normal people were examined simultaneously with each group in order to control the observations. The diet in each instance was made as uniform as was possible with so many individual tastes to be considered. Full diet with meat was allowed.

In each case a culture was taken from three different regions of the posterior sector. These regions were the posterior wall of the anal canal, the posterior mucocutaneous margin and the posterior sector of the perianal region. The posterior sector was chosen because that is in many cases the seat of the most intense clinical manifestations. In all, therefore, 132 original cultures were taken for study. As an example of the manner in which each was studied the chart of one is here shown (Chart 1).

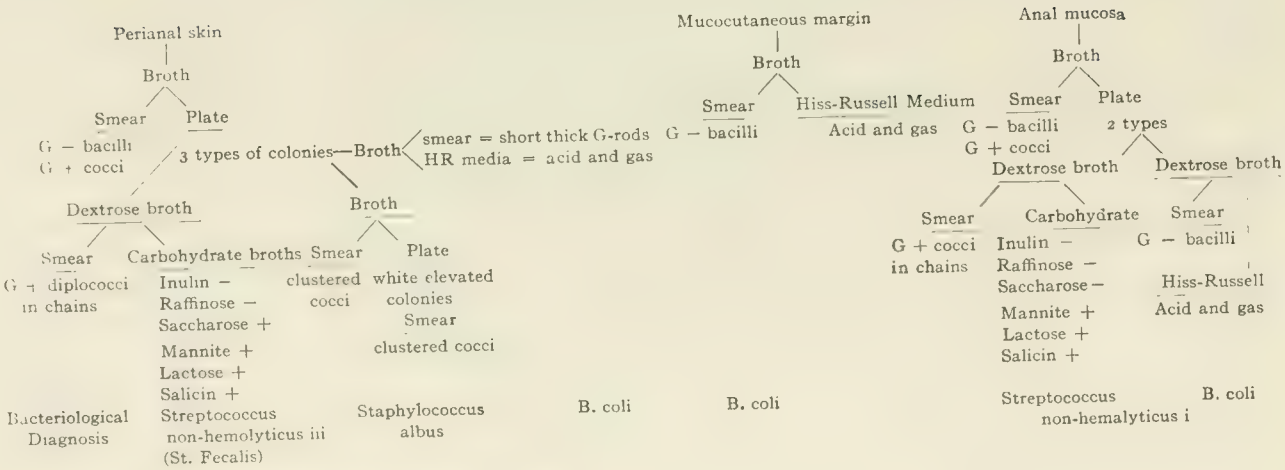
The area was exposed by inserting a large-sized sterile Brinkerhoff speculum with the slide posterior. Upon removing the slide the area was swabbed thoroughly with sterile liquid soap and then irrigated with sterile water. The culture was then obtained by heavily rubbing the regions indicated with sterile cotton swabs. The three swabs were then placed as obtained in separate tubes of sterile meat infusion of moderate alkalinity (.2 per cent to .5 per cent alkaline to phenolphthalein). Incubation at 37.5 degrees was allowed to proceed for twenty-four hours. At the end of this time a smear was made and stained by Gram's method. The culture was then plated out on dextrose agar. From the colony growths thus obtained one of each different type was fished out and planted on broth. From these last cultures smears were again taken, and if bacilli were found a Hiss-Russel stab was made, whereas if cocci were found the following carbohydrate serum tubes were inoculated: inulin, raffinose, saccharose, mannite, lactose, maltose and salicin.

An elaborate tabulation might be made of this work but the observations noted were of such a simple type that extensive tabulation would tend to confuse rather than elucidate. Instead of tabulating each case I will therefore present my findings bluntly in an epitomized manner (Chart 2). Any impartial bacteriologist will have no difficulty in confirming them.

It will be noted from the data submitted above that the bacterial species found were essentially identical in each of the three groups, and the presence or absence of pruritus of the anus apparently bore no relation to the bacterial findings. Whatever variation was noted was of such an unimportant nature as to be negligible, as for instance, the finding of B. coli communior in three instances, and certain differences in the occurrence of the minor components, as for example, B. lactis

CHART I

CLINICAL DIAGNOSIS-PRURITUS ANI (DIRECT PRURITUS OF THE ANUS)*



* Montague, J. F. Pruritus of the Perineum, New York, 1924.

Chart II

Regional Bacteriological Findings in Relation to the Presence of Pruritus

	Anal canal	Mucocutaneous line	Perianal skin
Ten normal persons	B. coli communis 9 Gram-positive diplococci 7 B. fecalis alkaligenes 3 B. lactis aerogenes 2 B. coli communior 1 Anaerobes 1	B. coli communis 9 Gram-positive diplococci 6 B. lactis aerogenes 2 B. fecalis alkaligenes 1 B. coli communior 1	B. coli communis 5 Gram-positive diplococci 4 B. subtilis 1 Staphylococcus epidermidis 1
Twenty with rectal disease without pruritus.	B. coli communis 19 Gram-positive diplococci 15 B. lactis aerogenes 7 B. fecalis alkaligenes 4 Anaerobes 1	B. coli communis 15 Gram-positive diplococci 11 B. lactis aerogenes 6	B. coli communis 11 Gram-positive diplococci 7 Staphylococcus albus 2 Staphylococcus epidermidis 1 B. subtilis 2
Fourteen without anorectal disease other than pruritus of the anus	B. coli communis 13 Gram-positive diplococci 12 B. fecalis alkaligenes 2 B. lactis aerogenes 1	B. coli communis 13 Gram-positive diplococci 7 B. lactis aerogenes 3	B. coli communis 7 Gram-positive diplococci 7 Staphylococcus albus 1
Summary Forty-four examined	B. coli communis 41 Gram-positive diplococci 34 B. coli communior 2 B. lactis aerogenes 10 Miscellaneous 11	B. coli communis 37 Gram-positive diplococci 24 B. lactis aerogenes 11 Miscellaneous 1	B. coli communis 23 Gram-positive diplococci 18 Staphylococcus albus 3 B. subtilis 3 Staphylococcus epidermidis 2

Number of original cultures taken 132
Number of growths obtained from such cultures 118
Failed to obtain growths of any kind in 14

aërogenes, etc. The term gram-positive diplococcus is used advisedly instead of the term streptococcus. Although some bacteriologists classify this organism as a streptococcus because of its tendency to occasional short chain formation I prefer to refer to it according to its more usual formation, namely as a gram-positive diplococcus, for the reason that the term "streptococcus" seems to imply pathogenic characteristics which this organism does not possess. Although it is true

FIG. 1. *Clinical Diagnosis:* Pruritus ani (direct pruritus). Subculture shows gram-positive diplococcus known as streptococcus fecalis.

that this organism does assume a short chain-like form when grown in dextrose broth, this fact does not seem to me to be of importance, inasmuch as many other bacteria will assume this form under the optimum conditions of rich media and proper temperature. It is probably the result of rapid division and subdivision of the bacteria proceeding without disturbance. The particular organism in question, moreover, shows its component diplococci very markedly even when chain form is assumed. (Contrast Fig. 1 with Fig. 2.) Even if we grant that it is a streptococcus by virtue of this tendency, it most assuredly does not simulate the true streptococcus pyogenes in any other way. To confirm the observations of other bacteriologists, and for my own

satisfaction, I have injected pure cultures of this organism in enormous doses into the peritoneal cavity of guinea pigs and into the subcutaneous tissues of dogs without the slightest reaction or infection. Knowing that this organism is the one that has been indicated as the specific causative agent, I determined to try to produce the disease of pruritus ani with it. However, as Park[3] admirably states, there is a distinction between

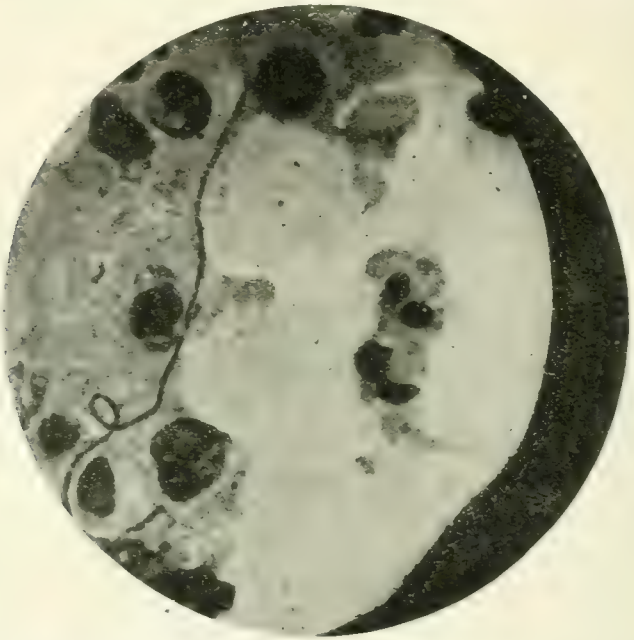


FIG. 2. Streptococcus chain in tissue derived from a true streptotoccus infection. Note the dissimilarity morphologically between the organisms shown in Fig. 19 and this.

an injection disease and an infection disease. In other words, the production of bacterial invasion by means of hypodermic injection often does not give one a true picture of the infective power of a bacterium. To meet this point, which I consider very well taken, I made several small collodion sacs and placed therein pure cultures of the organism. Such collodion sacs, while not permeable to the extent of leaking, will allow dialysis to occur by the process of osmosis. I therefore concluded that if placed in the anal canal sufficient of the culture would dialyze through to make the sac function very well as an artificial focus of infection to the neighboring tissue.

[3] Park, W. H. Pathogenic Micro-organisms. Philadelphia, 1920.

In this manner sacs containing pure cultures of the organisms in question were tried out. As a control, sacs of Ringer's solution (sterile) were used. Each sac was kept in situ for twenty-four hours, being replaced after defecation. While in place, irritation, at times itching, occurred; in all cases due no doubt to the resilient quality of the collodion. The intensity of irritation seemed about equal in all cases. After withdrawal, however, all cases promptly regained a normal state of sensation in the region (they were all normal cases). When however the perianal skin in the zone was deliberately scratched in one-half of the cases and the experiment repeated a definite pruritus remained after the removal of the sacs in several instances, one a B. coli and two Staphylococci. One of the latter was so intense that I was compelled to give a full Sabouraud pastille dose of roentgen ray to eradicate the condition. The gram-positive diplococcus, the Streptococcus fecalis of Murray's experiments, showed no power to invade, although a culture made from the sacs after the experiment proved its viability.

While the above mentioned studies were in progress I gradually came to the conclusion that if we were to avoid making a scientific farce out of so important a subject the bacteriological investigator must conduct his investigation not only along the lines of sound bacteriological practice but also with a thorough understanding of the underlying principles of infection and immunology.

No well-trained bacteriologist would seriously consider the results of a bacteriological examination unless he were certain that the material under investigation had been collected under such conditions and by such methods as would preclude its contamination. For instance, taking a culture of the anal mucosa or perianal skin with a non-sterile cotton swab without preliminary preparation of the area obviously renders the results valueless because we cannot rule out contaminating organisms. These were the conditions under which Murray's first experiments were performed. Nor does the preliminary scrubbing with soap and rinsing with sterile water, which method he used later and I used in my studies just described, entirely preclude the possibility of contamination for the reason that such casual cleansing cannot be thorough to the extent of removing all organisms lodged in the folds on the surface of the anal mucosa or perianal skin. This I concluded from my series, in which after cleansing the region in a manner that I deemed thorough, I still obtained a growth in 118 of the 132 cultures attempted. Had I successfully cleansed the area I should have had no growth whatever in any case.

To eliminate this element of obvious error I devised a method which was apparently successful. The results this led to are described below.

Since the term infection presumes the invasion of tissues by bacteria, I next attempted the culture from said tissues of whatever organism might be present in the pruritic tissue. Recognizing the difficulties of this, in view of my previous findings as to the bacteria on the surface of such tissue, I devised the following technique. After thoroughly washing the pruritic area with sterile soap and rinsing with sterile water, I then, under complete aseptic technique and sterile instruments, removed a small section of tissue from this area and dropped it into a tube of sterile broth. The cotton plug was flamed and also the tube mouth, and the tube placed in an incubator. Here it was kept at 37 degrees for twelve hours, when the tissue was removed by means of sterile forceps, rinsed in sterile water, and dropped into another sterile tube containing 5 per cent carbolic aqueous solution. Here it was allowed to remain for five minutes. Such treatment is considered by bacteriologists as sufficient to kill all living bacteria within reach of the fluid. I then removed this piece of tissue and rinsed it thoroughly in sterile water, and under continued aseptic methods cut it into four pieces, all of which were put into another tube of sterile broth and incubated as in the first instance, except for a longer time, twenty-four hours being allowed.

The rationale of this technique is as follows: By my first step I attempted to obtain a culture of organisms still lodged upon the surface. By exposing the tissue to carbolic solution I aimed at destruction of such surface organisms as existed after culturing; then, working under the assumption that I had destroyed all bacterial life on the exterior of my specimen I laid its interior open with the object of obtaining a culture from a part of the specimen.

I did this with eleven specimens. My results were as follows: *From the first culture* I obtained seven growths out of the eleven taken. All seven showed bacteria of the B. coli group. In six these were of the communis species and one was B. coli communior. In four of the seven there was also a growth of the Gram positive diplococcus. In one also a growth of Staphylococcus.

In my second culture I only obtained three growths out of the eleven taken. All three showed only one organism, B. coli. Only one of the three had shown surface growth by the first culture.

In checking over these three cases I stumbled upon a fact which has since proved of clinical importance to me in the treatment of these cases. All three of these had excoriated areas on examination, whereas the other cases apparently did not. It seemed to me, therefore, that this break in the natural barrier had permitted or made easy the bacterial invasions which my cultures seem to indicate. To check up on this I

took one case with, and one without excoriations and ran them through the same process. The results confirmed my suspicions as B. coli was cultured of the former and no organism from the latter. Here then, I reasoned, we have presumptive evidence of bacterial invasion occurring in cases which clinically present evidence of epidermal injury. To demonstrate this beyond the peradventure of a doubt and moreover to confirm the nature of such infection I next attempted to demonstrate the bacteria in situ in the tissues.

To this end I then procured eight specimens in cases of excoriations, and proceeded to attempt demonstration of the bacteria in situ.

As is commonly known, the demonstration of microorganisms in the tissues is at best a difficult task. Even in tissues or purulent exudate known to contain bacteria, it is surprising to see how few may be found in any given field. In addition to this difficulty arising from the low numbers to be found in any particular area there is the further complication that the protoplasm of bacteria responds to staining reagents in a closely similar manner to the nuclear chromatin of the tissue cells. Thus we are burdened with the possibility of an honest error in differentiating nuclei from microorganisms. Not only nuclei but also precipitated stain, chromatin granules, dirt on the slide or cover glass and various mitotic figures must be distinguished before we are certain that an object we discover is really organic in nature. In the skin the presence of normal pigment granules is one more fact to be borne in mind. All of these difficulties are experienced when searching for bacteria, particularly gram-positive organisms. When it comes to gram-negative bacteria the gram-differentiation method is rendered useless because of the fact that the tissue cells themselves (exclusive of the nuclei) also stain gram-negative. Inasmuch as one of the organisms under suspicion is the gram-negative bacillus B. coli the truth of these difficulties becomes especially apparent.

In obtaining the specimen to be subjected to this sort of an investigation great care must be taken and it should be done with as little handling as possible. The use of mouse tooth forceps is to be avoided as the specimen is torn by this instrument. A hemostat on the other hand crushes so as to render structure imperfect. The ordinary biopsy punch is not very well adapted for use in this region. Best results are obtainable from the use of an Allis clamp or anatomical forceps lightly held. Small pieces are preferable to large ones for the reason that although more difficult to work with they allow better permeation of the fixing, hardening and staining reagents.

The early fixation of the specimen is desirable so that post-mortem changes may be reduced to a minimum. Although many fixatives are

available the most satisfactory in my hands has been Zenker's fluid and 80 per cent alcohol. The use of absolute alcohol impairs the finer structure of the tissue, which it is of course desirable to preserve in a study of this kind. Corrosive sublimate has a tendency to make the tissue brittle and to precipitate it in minute quantities in the tissues, thus leading to undesirable confusion with microorganisms. The small amount of this substance in Zenker's fluid does not, however, appear to exert such an action. I have used formalin (5 to 10 per cent) with fair results.

In brief the method which has been followed in my studies is as follows: (1) Fix in Zenker's fluid for twelve hours; (2) wash in running water for twenty-four hours; (3) 95 per cent alcohol for twenty-four hours; (4) absolute alcohol for twenty-four hours; (5) acetone for two hours; (6) xylol till clear; (7) imbed.

Imbedding may be done in celloidin or in paraffin. The latter is by far the more preferable for this work for the reason that celloidin itself takes the stain to a certain degree and makes the distinguishing of bacteria unduly difficult. To imbed in paraffin we place the specimen in two successive baths at a temperature of 56 degrees for two hours each. The imbedded specimen is then mounted on a sectioning block and chilled. Sections are cut on the following day. These are best cut three to six microns thick.

The staining of these sections is most conveniently done with the sections attached to the slides. This may be accomplished by covering the slide with a very thin layer of a filtered mixture of equal parts egg, albumin and glycerin to which a small crystal of camphor has been added. The section is then floated upon a slide so prepared and set away in the thermostat for four to five hours. After this they may be stained.

As to the stains I used in this series: In an endeavor to demonstrate organisms in the tissue, particularly the B. coli which I felt certain I should find, I used over twenty-two different staining methods or modifications of these. The best results were obtained from Nicolle's modification of Loeffler's method, Hiss and Zinsser's modification of Gram's method and from MacCallum's modification of Goodpasture's method. The technique of these methods is as follows:

NICOLLE'S MODIFICATION OF LOEFFLER'S METHOD

1. Alcoholic methylene blue for from five to fifteen minutes or Loeffler's methylene blue for from one to twenty-four hours.
2. Wash in 1–1,000 acetic acid.
3. Wash in 10 per cent tannic acid for a few seconds.

4. Pour absolute alcohol over the section for from ten to twenty seconds.

5. Xylol till clear.

6. Mount in Balsam.

When using this method I have found it advisable to counterstain with eosin.

HISS AND ZINSSER'S MODIFICATION OF GRAM'S METHOD

1. Anilin-water gentian violet for from five to ten minutes.
2. Wash in water.
3. Cover with Gram's iodine solution for one minute.
4. Wash in water.
5. Absolute alcohol till no more color leaves.
6. Xylol till clear.
7. Balsam.

MACCALLUM'S MODIFICATION OF GOODPASTURE'S METHOD

1. Goodpasture's stain for ten minutes to one-half hour.

Goodpasture's stain:

30 per cent alcohol	100 c.c.
Basic fuchsin	0.59 gm.
Aniline oil	1. c.c.
Phenol crystals	1. c.c.

2. Wash in water.

3. Differentiate in 40 per cent (pure) formalin. This requires only a few seconds. The bright red color washes away and gives place to a clear rose color.

4. Wash in water.

5. Counterstain in saturated picric acid. The section should remain until it assumes a purplish color, three to five minutes.

6. Wash in water.

7. Differentiate in 95 per cent alcohol. The red color reappears and some of it is washed out. Some of the yellow of the picric acid is also washed out.

8. Wash in water.

9. Stain in Stirling's gentian violet five minutes or more.

10. Wash in water.

11. Gram's iodine solution for one minute.

12. Blot dry without washing.

13. Anilin oil and xylol equal parts until no more of the color comes away.

14. Two changes of xylol.
15. Mount in balsam.

This stain shows gram-negative organisms red; gram-positive organisms blue and the tissues are brilliant shades of red and purple.

Despite great care in the selection of cases, the obtainance of specimens and the staining thereof, bacteria were found in only seventy-four out of some seventeen hundred sections examined. This of course must be construed as being indicative of the absence of bacteria in all but

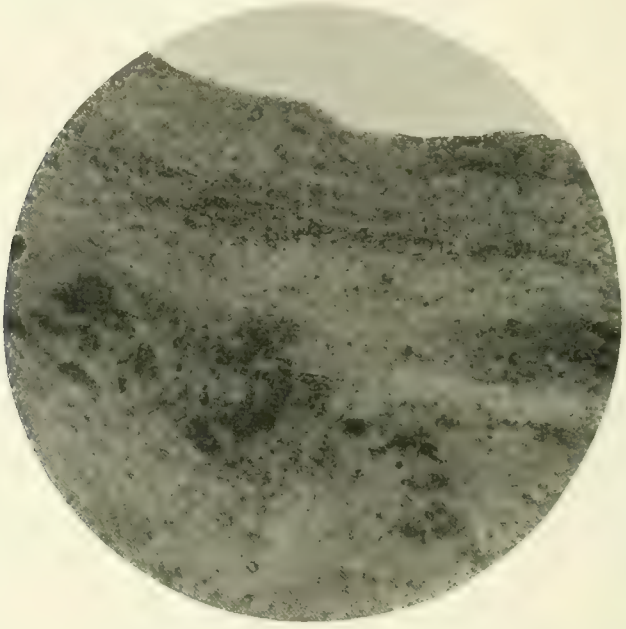


FIG. 3. Section of skin in pruritic area showing clumps of bacteria in the superficial layers of the epidermis. They are stained light blue and do not photograph well though they are distinct under the microscope. (MacCallum modification of Goodpasture-Weigert stain.)

the seventy-four. All that it can logically be assumed to signify is the success of the staining methods used in these instances. The bacteria may or may not have been present in the others but as utmost care and painfully persistent search failed to reveal their presence I feel safe in claiming that they were probably not there. Figures 3, 4 and 5 show a section in which I have been able to demonstrate their presence. They are to be seen in the superficial layers of the epidermis immediately subjacent to a crevice in the surface. Unfortunately they are stained

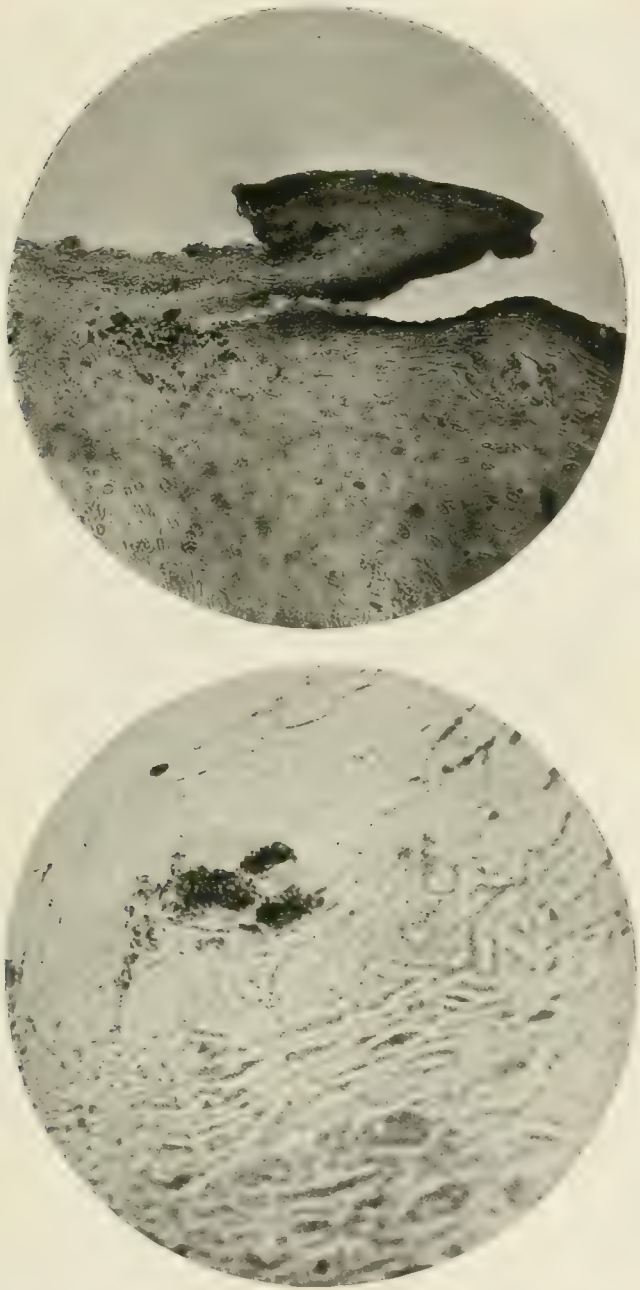


FIG. 4. Bacteria in the epidermal tissue in case of pruritus ani. Note superficiality of bacterial invasion and nearness to break in the stratum corneum. Organism is staphylococcus albus according to cultures on this same case.

light blue and although perfectly distinct to the eye they do not photograph well. Under the microscope this specimen shows perfect clumps of staphylococci. In all of the specimens showing organisms present said organism was, morphologically, a staphylococcus and this was substantiated on culture in each case. In no case did their invasion appear to reach further than half-way to the basement membrane of the epidermis. Likewise in each case there was an evident break in the surface epidermis or a distinct cytolysis of the superficial layers. There was not

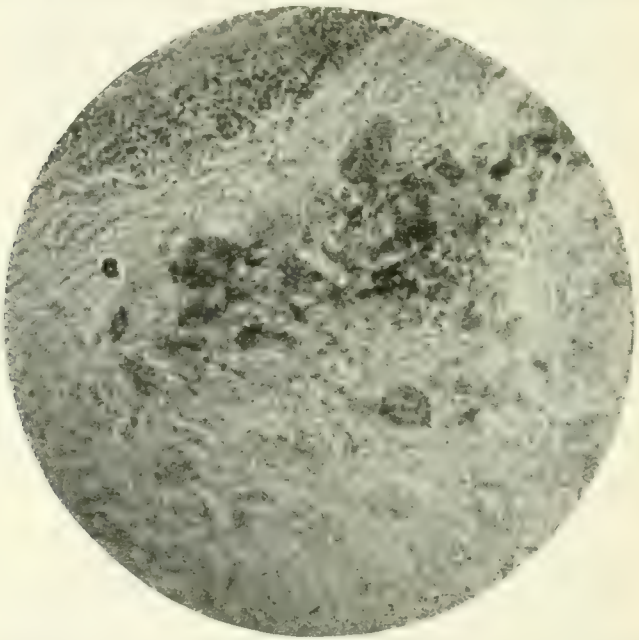


FIG. 5. Clumps of staphylococcus in the epidermal tissues in case of pruritus ani. Stain thionin-blue. × 2500.

a single instance in which B. coli or the Streptococcus fecalis was demonstrated in the tissues.

My conclusion naturally follows that where the epidermis is injured by traumatism or maceration an invasion of bacteria may occur. This invasion in the cases studied is moderate and limited, due either to the resistance of the epidermal cells or to the low virulence of the invading organism.

Since invasion of the tissues has been accomplished by the organism it fulfills the first postulate of the infection. Its growth in clumps indicates its subsistence there. So that in truth we here have an infection surmised and proved. As previously mentioned the bacterium found

was the Staphylococcus. I trust the reader will recollect the proportion of cases in which it was found and thus avoid the error of thinking that every case is due to infection. I firmly believe that more cases are due to infection than my findings prove to be the case but I am just as firmly convinced that the percentage is much lower than is commonly supposed.

It must be apparent to anyone who has carefully read the foregoing that the idea of the causative agent of whatever infective condition we have proved to exist being streptococcal is decidedly beyond the pale of logical probability. I consider the occurrence of infection as proved. But the evidence on hand favors a different etiology than that of a streptococcus. On the basis of experimental results mentioned previously I feel certain that both staphylococci and B. coli can be justly regarded as the probable infective agents. The observations contained in this report suggest a very plausible relation between demonstrable infection and visible clinical lesions or alteration in the affected area. It is recommended that this fact be borne in mind in the treatment of cases presenting such lesions. This is particularly the case where vaccine therapy is contemplated. The intelligent use of vaccines will give gratifying results but their unintelligent application can only result in bringing into disrepute a truly useful therapeutic agent.

DISCUSSION

Dr. Joseph F. Saphir, New York, N. Y.: Personally, I cannot say very much about the work that has been presented to us in such an excellently scientific manner by Dr. Montague because I have not done any work along that line. I do not know enough about bacteriology or pathology to enter into a detailed description of the subject under discussion.

I am more interested in the relief or cure of pruritus ani in patients that come to us, and I will leave a discussion of the ultrascientific details to those who are more fitted for it than I am. I do not know enough about it to discuss it intelligently.

At one time I got the Streptococcus fecalis vaccine and we used it for injection in our patients, and in some cases we got good results and in others we did not.

Dr. Hanes at the 1922 meeting presented a new feature in regard to the use of hydrochloric acid for the relief of pruritus ani. I do not know whether I am on the right track in entering into the question of treatment rather than the bacteriology of the subject, but we were all interested in Dr. Hanes' work regarding the use of hydrochloric acid for the relief of pruritus ani. I wrote to a number of fellows, asking them whether they had tried it or not, and if they had, what were their results. Until three months ago I was afraid to use hydrochloric acid for the relief of this condition. However, at that time a man was referred to me from the South who had a distinct case of pruritus. I told him he would have to stay in New York for a period of three to six months in order to give him relief or to effect a cure. He could not stay in New York. I referred him to Dr. Terrell in Virginia. At the end of about a week I received a letter from Dr. Terrell thanking me for referring this patient to him. He had used a solution of hydrochloric acid, 1–2,000, which he injected into this

patient, and wanted to let me know that the patient was very much relieved. About a week later I received a letter from the patient thanking me profusely in terms of extreme gratitude for having referred him to Dr. Terrell. He said he was relieved immediately, and that Dr. Terrell hoped to have him call in three or four weeks when he would make another injection. I picked up a little courage and tried the hydrochloric acid injections on some clinic patients, and got results. Although I was a little bit backward at first and was afraid to use this method, I tried it out in fourteen cases with excellent results. A young man, a law student, was unable to attend to his work preparatory to his final examinations on account of inability to sleep due to the pruritus. He was unable to attend to anything during the day. I got him into the hospital after telling him he would have to stay there a day. He had lots of pain but was relieved by the injection of hydrochloric acid. I called to see him three hours after I injected him and he said that he was greatly relieved. He left the hospital the same day, and felt little itching or pain. This took place three or four weeks before I left New York, and he has had no itching since.

I would like to know if Dr. Hanes has sent an abstract of his paper to be read at this meeting, because we are all interested in this subject. I have simply told you of my experiences with the use of hydrochloric acid injections in cases of pruritus anis

Dr. Arthur C. Crookall, Seattle, Wash.: I was pleased to hear Dr. Montague'. paper because I have never believed that any specific organism was the cause of pruritus ani. I have felt that this disease was a chronic superficial infection similar in nature to bronchitis, urethritis, etc. I think the investigations of Dr. Montague have shown this to be a fact. The reason I have believed that pruritus ani was due to a chronic superficial infection is because in using the same methods of treatment we use in such diseases in other parts of the body, for instance, chronic urethritis, the drugs we use particularly influence the tissues in such a way as to increase their resistance to all bacteria. In other words, the local opsonic index is raised and if this line of treatment of local stimulation with various chemicals is followed up persistently a large percentage of these cases can be cured.

For the reason that Dr. Montague's paper assists in putting the disease under discussion on a sounder pathological basis, I was particularly glad to hear it.

Dr. James C. Minor, Kansas City, Mo.: I regret very much that I did not hear the full content of the paper under discussion. I am very much interested in the treatment of pruritus ani. The majority of cases of pruritus ani with which I have had to deal are due to some pathology at the anus or within the first three inches of the rectum. It is my intention to try out Dr. Hanes' hydrochloric acid treatment in some of these cases.

Dr. Montague has presented a splendid scientific paper which I am sure will be productive of good results.

Dr. William M. Beach, Pittsburgh, Pa.: Our present knowledge spells progress. The study of pruritus ani has been one of an evolutionary kind. In 1909, about the same time that Edwards discovered the same thing, I found what I thought to be one of the causes of pruritus ani, and that was the presence of sinuses in the anal canal.

I am not able to discuss the paper presented today with intelligence, but it is a paper that shows an advanced step in the history of our knowledge of this subject, and I want to thank Dr. Montague from the bottom of my heart for his original scientific research in this matter. We cannot all be research workers. Research workers

are born. I am simply a humble follower of the truths that are established by such men as the reader of this paper.

The sinuses that I have mentioned are undoubtedly foci for the development of those bacteria that we have had explained to us today. In perhaps 70 per cent of cases where I find pathology the patients may be cured or at least much benefited. There is a certain percentage of cases that will continue in spite of what you do.

Dr. Ralph W. Jackson, Fall River, Mass.: If you will recall the paper which Dr. Montague presented last year, and compare it with this one, you will see that he has by no means given us today his views *in toto* in regard to pruritus ani. This paper is not on the treatment of the disease, but next week he will present one before the American Medical Association, and will then probably have something to say about the anti-bacterial treatment of Dr. Hanes. The hydrochloric acid solution may be one means of cure for cases of bacterial origin, but Dr. Montague will probably offer something entirely different for cases of pruritus of constitutional or reflex origin.

Dr. J. Rawson Pennington, Chicago, Ill.: Cracks in the anal tissue are rather common in pruritus ani. Whether or not bacteria lodge in these cracks and become imbedded in the deeper tissues and cause pruritus I am unable to answer, though one of the photographs exhibited by the essayist was a beautiful example. If cracks or abrasions are the predisposing factors of pruritus is it reasonable to suppose that primarily the improper use of toilet articles may have been the cause of the cracks? Many cases of pruritus get well under local treatment. In fact, I believe that a very large percentage of the cases can be thus cured. A valuable agent in the treatment of some cases is the injection of alcohol. This, however, is not new.

Dr. Arthur H. Earley, Denver, Col.: I should like to say a word or two on the alcohol treatment of pruritus. Dr. Stone wrote an article on this subject in 1916 which was published in the *Bulletin of the Johns Hopkins Hospital* in which he reported a number of cases of pruritus treated by alcohol. I think it is one of the methods of treatment you ought to have up your sleeve. Next to doing an operation that may fail you should think of alcohol injections, and if they do not succeed you can use a modified Ball operation. I have used alcohol in a great many cases. The percentage of alcohol is 70 to 80 per cent. A point about the treatment is the technique of the injection. It is rather painful, and you do not give it in massive doses under the skin, but you puncture the skin at several points and deposit at each point three minims of 70 to 80 per cent of the solution. There is a slight reaction following the injections, but relief is immediate and you get results, and the relief will last a varying length of time. The injection has to be repeated, but this treatment can be carried out in the office without special preparation, and you will find the results are satisfactory. Use three minims, make punctures at twenty different spots, inject the solution in a concentric circle, beginning at the outer circle and going all around. In sensitive patients you may inject novocaine first, but theoretically there is an objection to using a dilute solution. If you put in a lot of water it dilutes the alcohol, and it goes just beneath the skin and has an effect on the nerves and acts very much as the Ball operation in putting the nerves out of commission.

Dr. Jackson: How far do you insert the needle?

Dr. Earley: Through the skin.

Dr. Jackson: Is there any back leakage of the alcohol?

Dr. Earley: No. We use a very small needle of 27 or 28 gauge. It goes in about one-half inch.

Dr. Montague (closing): I must plead guilty to being ultrascientific if this be inappropriate in a medical meeting. However, I earnestly feel that we have to consider the scientific aspects of this subject. Empiric treatment of any disease sooner or later gives way to rational treatment based on an understanding of its pathology.

I have not considered the disease from the standpoint purely of treatment. Here I have presented a series of pathologic slides which represented 1,700 sections from cases which I have studied in an attempt to find a scientific reason for the disease. This is only one portion of my work. You may remember that I gave another portion of it last year which is printed in our present volume of *Transactions*. As a matter of fact, the entire amount of material I have appears in the form of a book,[4] and this is only one of the chapters.

I do not believe that 100 per cent of the cases of pruritus ani are of infective origin. Our present researches do not bear out such a conclusion. It is true, there is a definite percentage of cases that are infective in origin, and whether primarily or secondarily is debatable. However, I am not entering into that phase of the subject.

In regard to the suggestion of hyperacidity as an etiological factor I cannot agree. It seems irrational to my mind that hyperacidity or increased acidity in the blood stream could cause a localized pruritus unless there is previous pathology in the area, and if there is previous pathology in that area there is a primary cause for it, and the hyperacidity is secondary.

Dr. Pennington wants to know whether a certain thing is the cause of pruritus ani. Speaking on the basis of a rather close and careful study of the subject, I should like to say positively that there is no one cause. Infection may be a cause; visceral pathology may be a cause; any number of things may be causes as outlined in my paper presented last year. As to whether any one thing is the cause of pruritus; it may be a cause for one case, but not for all cases.

I have been conducting for over a year and a half in New York City some experiments on animals, and I find that the disease does occur among certain animals and is chiefly of chronic visceral origin.

In regard to the reason why certain measures relieve pruritus ani, such as operative measures and hydrochloric acid injections and alcohol injections, I will simply say it might be well to quote from my previous paper in which I divided pruritus into two distinct conditions. One a direct pruritus which involves the peripheral nerve endings or nerve fibers near by; the other cases are those that have their origin entirely apart from the local origin where the itching is felt, and the itching is felt in the area where the cause is not.

In these instances it is a mis-referred sensation. The bacterial invasion theory is a very important one in connection with the consideration of this subject as I pointed out last year.

[4] Montague, J. F. Pruritus of the Perineum, New York, 1924.

SACRAL ANESTHESIA IN PROCTOLOGIC SURGERY

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LOS ANGELES, CALIF.

For anesthesia in rectal surgery the surgeon depends on local, general, synergistic, pre-sacral, trans-sacral, spinal, sacral block and caudal block or sacral anesthesia.

An anesthesia producing the best results and having the least objectionable qualities will be the anesthesia of choice. Sacral anesthesia seems to fulfill these requirements.

Anatomy: The sacral canal begins at about the second sacral vertebra and terminates at the sacral hiatus. Normally the hiatus is triangular in outline. The apex is formed by the last sacral spine, the base, by an imaginary line connecting the two sacral cornu, which are two small, bony prominences formed by the coalescence of the fourth and fifth sacral vertebra. This opening, the entrance to the sacral canal, is covered by the thick posterior sacrococcygeal ligament. The canal contains the filum terminale, blood-vessels, connective tissue and fat. It averages from 7 to 9 cm. in depth, the cavity conforming to the contour of the sacrum. Ten or fifteen cubic centimeters of methylene blue completely stain the contents of the canal. The color can be seen at the exit of some of the sacral nerves, and can be traced a short distance above the termination of the dura mater spinalis.

History: Cathelin of France, is recognized as having performed the first sacral anesthesia (1900), using cocaine in animal experimental work, but failed to anesthetize the human canal. The first surgical demonstration, with novocaine, was made in 1909 by Stoeckel. The next year Lawen and Gros adding sodium bicarbonate, showed a better anesthesia. Its first use in the United States was in 1914.

Solutions: In all work forming a basis for this paper, 1 per cent or 2 per cent novocaine in an alkaline solution has been used, except one series of five cases, in which 1 per cent apothesine with 2 per cent each of magnesium and calcium chloride were used. These drugs were also used in conjunction with novocaine, in place of sodium bicarbonate, together with chloretone 0.8 per cent. Adrenalin, in from three to ten drops has been used in all solutions. The amounts injected varied from 25 or 30 c.c. of the stronger to 50 c.c. of the weaker solutions. The formula which gave the best results consisted of 35 c.c., 2 per cent novocaine solution, 15 c.c., 1 per cent sodium bicarbonate solution, adrenalin three drops, mixing the freshly prepared solutions just before using.

Very recently the Lawen powder, now used at the Mayo Clinic, but put up in ampules is being tried. This consists of novocaine 0.6 gm., sodium chloride 0.1 gm., sodium bicarbonate 0.15 gm., dissolved in 30 c.c. of sterile distilled water, with three drops of adrenalin, making a 2 per cent solution.

Technique of injection: Injecting with the patient in the lateral flexed position was abandoned after a few trials, owing to the difficulty of controlling nervous patients, the danger of a broken needle, and the awkward position of the anesthetist. The prone position, with the pelvis elevated on a cushion, is now used. With 1 per cent novocaine and a fine needle, a wheal is made in the iodine-painted skin. This is continued through the subcutaneous tissue and the ligamentous covering of the hiatus. It has been found that with this local anesthesia the patient will submit more kindly to the slight discomfort of the injected fluid. An 18 or 20 gauge needle of the spinal type is used. The operator should be sure that the needle is in parallel with the sacral spines, except in cases of a deflected hiatus. It should enter the skin over the hiatus, about 1 cm. below the apex at a degree somewhat less than a right angle, till the point has passed through the ligament, and bone encountered. Depress the shoulder of the needle and gently pass the needle into the canal about 5 or 6 cm., the point in contact with the bony anterior and posterior walls, being evidence that it is in the sacral canal. The needle is then withdrawn till only 1 cm. is in the canal. Pull out the stylet, watch for the appearance of spinal fluid or blood; either is an indication for removal of the needle point to a new location, till all flow has stopped. The safety of the patient depends so much on this that it must be scrupulously observed. A very slow injection is made with a large Luer syringe. A too rapid injection causes unnecessary suffering. It was formerly the custom to deposit most or all of the solution in the upper region of the canal, assuming that 25 or 50 c.c. would reach all parts of the canal. Owing to the large openings of the upper sacral foramina, this assumption could very easily be wrong. More recently the injection has been placed in the lower part of the canal. Pressure discomfort, the most constant symptom noted with a successful anesthesia, seems less pronounced with a low placed injection, though its absence does not necessarily indicate failure. Preliminary narcotization has not been used, though in some few cases it might have been of extreme value.

Time and area of anesthesia: Anesthesia is more quickly produced with a low injection, being complete within an average of ten minutes; with a high injection, anesthesia is rarely effective before fifteen or twenty minutes. The duration of each is about the same. Two experiments omitting adrenalin very definitely showed its value in prolonging

analgesia. The anesthetized area encircles the pelvis, from the point of injection above, to a plane irregularly surrounding the thighs, at a level somewhat inferior to the gluteal creases below (low sacral). Occasionally it has extended as high as the umbilicus (high sacral). All organs contained in the pelvis are affected.

Difficulties and failures: Ordinarily with the patient in proper position, entry to the sacral canal is not a matter of any particular moment. Difficulty is found when any of the various shaped hiati are smaller than normal, or are met with in a flattened posterior surface of the canal. The proper identification of the sacral hiatus between two prominent cornu, and a well defined last sacral spine is not hard. However, these so-called triangles vary so as to outline, occasionally as to position, the cornu may be so flattened, or so obscured by fat, the sides of the triangle so close together, in old patients the ligamentous covering so cartilaginous, that the exact definition of the hiatus may be very difficult or impossible.

Radiography has been utilized to remove the indefiniteness of localization. The three bony landmarks of the triangle are spotted with an aniline dye. Carbolfuchsin has been the most satisfactory. All rectal gas must be removed. The aniline skin spots are covered with lead dots and the film taken with the patient prone. In this way any deviation of size, contour or location is shown.

Failure of anesthesia may be due to (1) the needle having entered the muscle on either side of the spine, (2) to having penetrated the sacrococcygeal articulation, (3) the point having penetrated beneath the periosteum of the canal, (4) a solution of insufficient amount, strength, or inferior quality used, (5) the solution injected too high in the canal, may run out as fast as introduced or if retained did not gravitate to the lower segment of the sacral cord. Unilateral anesthesia may be explained by some anatomical abnormality or pathological condition preventing contact of the solution with all parts of the sacral canal.

Reaction and danger: During the early trials of this anesthesia, a few patients developed, during injection, a slight convulsive-like tremor, an oppressive sensation in the cardiac region, dyspnea and a feeling of palpitation. These symptoms lasted but a few minutes and subsided spontaneously. The only treatment being to stop the injection for a minute or two, and when again begun to give it more slowly. None of these symptoms have been noted since reducing the adrenalin dosage. Some postoperative nausea has been encountered, very rarely vomiting and at no time with any prostration. The 2 per cent solution seems to give a slightly greater tendency to nausea.

Inadvertent injection into the spinal canal or into the blood stream are the two dangers to be avoided. In the few fatalities recorded, only the former has been given as the cause of death. The dura has been entered twice in the series of cases anesthetized in the proctological service at the Los Angeles General Hospital. In both cases perfect anesthesia was secured without any untoward symptoms. The reason for advising the use of a twenty gauge needle is obvious, when the ever present possibility of a dural puncture is remembered.

Postoperative effects: The average duration of anesthesia in hemorrhoidal surgery has been about one and one-half hours, some two to four hour cases, and one nine hours. Fistula, abscess, and Percy cautery cases seem to have a somewhat longer period of anesthesia. No contraindication to repetition of sacral anesthesia has been encountered. In a failure there has been no hesitation in immediately repeating the injection. No symptoms have resulted from the double dosage. Retention of urine is not so frequent a complication.

Uses: It is of course ill advised in the case of children. It could not be used in the presence of a skin infection over the hiatus. It is applicable in all forms of rectal and perirectal surgery. It can be readily seen how sacral is the anesthetic of choice in the tuberculous abscess or fistula, particularly when associated with an active pulmonary condition. No other form of anesthesia can offer these cachectic, low blood-pressured individuals the safety assured by this method. In the total resection of the lower rectum, with the Percy cautery, sacral offers the best means for a shockless operation.

Caudal block is especially indicated in perirectal, ischiorectal, bilateral abscesses, and horse shoe fistula. Perfect continuous sphincter relaxation is obtained. The operator is never annoyed by the occasional sphincterial contractions of a general anesthesia. In hemorrhoidal surgery, the pathology is viewed, unchanged by the edema of an infiltration anesthesia. Neither renal, cardiac disease or shock are contraindications.

Conclusions: The foregoing deductions are drawn from a series of 300 sacral anesthesias in the proctologic clinic of the Los Angeles General Hospital, and in private practice; thirty-one of these were failures. Five of these failures occurred with the use of apothesine. As there was no combination with pre, trans-sacral or local, sacral anesthesia alone is responsible for failures and successes. How many poor results were due to injection high in the canal, will remain an unsolved question. While the series of low injections is much too small to be of real value, the appearance of anesthesia in from seven to ten minutes in place of from fifteen to twenty minutes, and no failures, seems of enough importance to deserve mention and be worthy of consideration.

Radiography has been a very practical adjunct in localizing and defining the hiatus. Its special field of value, naturally, has been in those cases of poor or obscured landmarks.

To be successful the anesthetist must know and visualize the anatomy. While sacral anesthesia will not admit of poor technique, patience and perseverance play almost as important a role as skill, in the end result. Its simple composition and preparation makes it available to all. It is a regional anesthesia that embodies safety, ease of administration, and perfect effect, with minimum after-results. It makes possible with one injection, a prolonged operation, or proctologic surgery involving a large area.

It is felt that the above are sufficient reasons to warrant the more general use of sacral anesthesia.

DISCUSSION

Dr. D. C. McKenney, Buffalo, N. Y.: Those of you who have not employed sacral anesthesia will be surprised at the ease with which it can be used in most cases and the completeness of the anesthesia. The external sphincter ani muscle dilates fully and the lining of the lower rectum and anal canal everts bringing plainly into view any pathology and making manual dilatation unnecessary. The technical difficulty one occasionally encounters in this method of anesthesia is getting the needle into the hiatus sacralis which is especially apt to be the case in very fleshy individuals. Dr. Murietta has brought out one very valuable point which is that we must get the needle started parallel and close to the bone at the bottom of the hiatus. In fleshy people it is difficult to feel on either side of the hiatus the two bony points between which the needle must be inserted. In such cases it is helpful, with the index finger in the rectum and the thumb on the outside, to grasp the coccyx by the tip and wiggle it, thus identifying the sacrococcygeal joint, immediately above which in the median line is the hiatus sacralis. When the needle enters the hiatus the feel is as though it had punctured parchment and its progress then is easy. If it strikes bone the angle of insertion must be changed. If the canal is missed when the solution is injected there will be a swelling over the sacrum.

Dr. Joseph F. Saphir, New York, N. Y.: From what I have seen this morning sacral anesthesia has greatly impressed me. Personally, however, I have not tried sacral anesthesia for the particular reason that I do not know enough about it. It seems difficult for those of us who have not tried it. However, after seeing the number of cases in which Dr. Kiger has resorted to its use, one feels more assured of its efficiency and I am sure we shall be prompted to look more carefully into the subject and use more of this type of anesthesia. In New York we do not do very much of it. They do a great deal of it in South America, and it would be an excellent thing for the American Proctologic Society to take it up.

I would like Dr. Kiger to describe for us a little more definitely the technique of this method of anesthesia for rectal work.

Dr. William H. Kiger, Los Angeles, Calif.: To be honest with you, I have not resorted to sacral anesthesia myself. Dr. Murrieta has been doing all of our sacral anesthetic work. I am partial to spinal anesthesia; I have used it for a great many

years and it has never failed me. Out of 6,000 cases I have had no trouble. Dr. Murrieta has been giving all our sacral anesthesias and we have tried it out very thoroughly. We have had about 20 per cent failures, but Dr. Murrieta says that the percentage is not that large. However, there are some failures connected with it. Tomorrow I will show you the technique at the clinic.

Dr. Frank C. Yeomans, New York, N. Y.: I have employed sacral anesthesia for several years but not as a routine measure. I would like to ask if you take an *x*-ray picture of every case before administering the anesthetic. That being the case, it seems to me that the delay in obtaining the roentgenogram would be a disadvantage in many minor operations suitable for local anesthesia.

Dr. Murrieta (closing): The point made by Dr. McKenney with regard to locating the hiatus is very good, provided the coccyx is not ankylosed to the sacrum. If it is ankylosed you cannot move it and you get no information at all. The *x*-ray films will make it unnecessary to introduce the finger into the rectum and contaminate the hand, and as you have to use that hand, changing gloves wastes time in starting the anesthesia.

I have had occasion to use sacral anesthesia on a patient to whom I had formerly given sacral anesthesia successfully. The patient felt the solution going into the muscles of the back, but he was absolutely non-anesthetized.

Dr. Saphir referred to sacral and spinal anesthesia mixed. There were only three sacrals, and the rest were spinal anesthesias given by Dr. Kiger.

The technique of spinal anesthesia is much quicker and in giving spinal anesthesia you are never in doubt as to whether you get the spinal fluid or not. You know you are in the spinal canal. The novocaine is dissolved in the barrel of the syringe by the spinal fluid. You get an anesthesia that is immediate and it lasts as long as sacral anesthesia. It does not last quite as long, but to all intents and purposes as long as necessary. You obtain quicker results with spinal anesthesia than you do with sacral anesthesia, and that is why Dr. Kiger likes spinal anesthesia. With the technique Dr. Kiger uses in his spinal anesthesia work, he enters the dural canal from the side and not in the center. He punctures the dura mater when he puts the needle in, the puncture closes itself and the puncture is made to either side of the spines of the lumbar vertebrae.

With reference to caudal anesthesia and sacral anesthesia, as I understand it, they are the same. Parasacral anesthesia anesthetizes the posterior sacral foramina on each side. This can be done alone, or it can be done in conjunction with sacral anesthesia. Sacral block is the name that is applied to parasacral anesthesia and caudal anesthesia. Presacral anesthesia is another form of anesthesia which Labat has mentioned and is to be given with the patient in the dorsal position. The needle punctures to the outer side of the anus and catches the sacral nerves as they emerge from the anterior foramina. We have never tried it, but it seems to me, that as the rectal walls are normally in apposition, we would not know whether the needle punctured the rectum or not, a very undesirable complication.

ANORECTAL OPERATIONS UNDER LOCAL ANESTHESIA

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NEW YORK, N. Y.

In 1920, Dr. Louis J. Hirschman read a paper on the standardization of operations for internal hemorrhoids, in which he stated: "In our own specialty it seems that the time has arrived for our consideration of the standardization of certain operative procedures directed to the relief of some of the more common proctologic affections."

It appears to me that not enough serious thought or consideration was given to Dr. Hirschman's plea, and it is the object of this paper to renew this plea for standardization and to elicit further discussion with especial reference to operations under local anesthesia.

The entire medical profession looks up to the American Proctologic Society, and in its annual *Transactions* expects to find the last word in things proctologic. By neglecting to place ourselves on record as accepting certain operative procedures and condemning others, we fail in our endeavor to hold that authoritative position in proctology that we should hold in the medical body.

Local anesthesia in rectal operations has been developed and perfected to a stage where we can safely say that in the hands of the Fellows of the American Proctologic Society, from 60 to 95 per cent of all anorectal conditions requiring operation can be performed without the use of a general anesthetic. Some of us are more partial to its use than others.

For the past thirty years, the profession has been interested in local anesthesia. Various strengths of numerous solutions have been used, ranging from 6 per cent cocaine or beta-eucaine solution down to $\frac{1}{8}$ or 0.1 per cent with relatively good results. Even sterile water has been used with some success.

But a local anesthetic to be valuable must not of itself be a cause of pain either before its action is established or after its action has ceased. None of the drugs are used pure, but all should be dissolved in isotonic fluids with the juices that bathe the body cells, such as a 0.9 per cent solution of common salt.

Cocaine has its disadvantages even when used in 0.1 per cent strength, in the rectum, and is followed by severe excruciating pain almost immediately after operation, and also presents toxic symptoms. Beta-eucaine has almost the same action as cocaine, and produces the same symptoms as a protoplasmic poison but when used in larger doses,

it is less powerful as a local anesthetic, does not diffuse as well and is more irritating, but can be sterilized by boiling. Stovaine is too irritating for infiltration about the anus, but may be used for spinal anesthesia.

Alypin is soluble in watery solutions, is less active but more irritating than cocaine, and produces the same toxic symptoms. Novocaine is feebly poisonous, and up to 10 per cent solution is non-irritating, may be sterilized and re-sterilized without any marked effect upon its anesthetic properties. I have discarded quinine and urea hydrochloride, which I have described in previous articles[1] because of the almost immediate production of fibrin into the injected tissues, somewhat distorting the geography of the operative field, the frequent delay in healing, and the sloughing of the tissues that sometimes takes place due to the delayed absorption of the fibrin. Its valuable quality is that of producing an anesthesia for three to ten days.

The physiological action of all the above drugs with the exception of novocaine and cocaine is incompatible with adrenalin.

The only drug relatively non-irritating, non-toxic, at the time of use and after operation, soluble in water, capable of being sterilized with heat, and non-antagonistic to adrenalin, is novocaine.

In a series of over 2,000 cases, I had successfully operated upon, using quinine and urea for local anesthesia, and advised its use as representing 70 to 75 per cent of all cases requiring operative interference.[2]

About a year ago, Dr. Zobel of San Francisco, while on a visit to New York, demonstrated to me the use of novocaine with adrenalin, and for the past year I have limited myself exclusively to the use of novocaine, and have found it to be the most practical. For rectal operations I think it should be the anesthetic of choice, on account of its slight toxicity, its permitting the use of larger doses without danger, and the carrying out of a complete operation performed with difficulty or not at all with cocaine. It has marked anesthetic power and is neither irritating nor has it any dilating effects upon the blood-vessels. The disadvantage of novocaine is its short duration as a local anesthetic, lasting only about twenty minutes, but the addition of three minims of adrenalin to the ounce causes the anesthesia to become more pronounced and of longer duration without adding to the toxicity of the drug.

The nerves supplying the anus and rectum are: The pudic nerves supplying parts of the anus; the pelvic branches of the posterior cutaneous femoris, which pass through the inguinal canal and supply the anal region and perineum and the nerves originating from the coccygeal

[1] Saphir, J. F. *N. York M. J.*, 1916–1919.

[2] Saphir, J. F. Quinine and urea hydrochloride, the ideal local anesthetic. *N. York M. J.*, Dec. 22, 1917.

plexus supplying the anal region. The sympathetic ganglion has no part in the sensory innervation.

Bilateral blocking of the trunk of the pudic nerve will not be sufficient to produce anesthesia of the anus, nor will the filling of the ischiorectal fossae with ½ per cent novocaine solution be sufficient, although this will cause blocking of the branches of the pudic and posterior cutaneous femoris nerves supplying the anus.

Sacral and spinal anesthesia, I will not touch on, as I do not use it, but in the hands of competent men, they produce excellent relaxation of the sphincter muscle, and anesthesia of the anal region. The mucosa of the stomach and intestinal tract, we all know are insensitive. Even in the most sensitive persons, absence of sensation begins in the oesophagus and extends to the rectum; painful sensation again appearing in this part and becoming more pronounced in the anal portion at the mucocutaneous junction, where the rectum ends and the anus begins. Absolute lack of sensation of the mucous membrane of the colon may be demonstrated in any artificial anus, as in a colostomy or ileostomy, or a sigmoid when fixed to the anal or sacral region.

For the production of local anesthesia in rectal operations, four points of entrance about the anal region originally were used, two or three fingerbreadths distant from the anal orifice. The solution was injected perpendicularly, at the lateral points, parallel to the wall of the rectum into the sphincter and levator ani muscles, then into the subcutaneous tissues using about five to six ounces of solution.

For many years the direct method of infiltration of various solutions into the tissues to be operated upon or to be removed was practiced.

During the past year, following the method as used by Dr. Zobel (although he does not claim originality), I have found in a series of over 500 cases, that the best and most reliable method of producing local anesthesia for operations upon the anus and rectum, lies in circuminjecting the anus.

For this purpose I employ an isotonic solution of ½ per cent novocaine, with the addition of three minims of adrenalin (1–1,000) to the ounce. Greater concentration is not necessary.

Beginning at a point about one-half inch posterior to the anal margin, with the aid of a fine needle about two or two and one-half inches long provided with a sharp point for easy entrance, inject under the skin about the anus, first to the right and then to the left without removing the needle, so that the tissues circumscribing the anus receive the benefit of about four to six drams and very seldom more than one ounce of the solution. After massaging the injected parts for about one or two minutes, to allow for the proper dissemination and absorption

of the anesthetic fluid, you get a most complete relaxation of the sphincter muscles, even in the presence of a very acutely painful ulcer or fissure, or a very greatly hypertrophied muscle. The anus becomes patulous, completely relaxed, and brings into view any and all rectal pathology that may be discovered when the patient is under the influence of a general anesthetic. There is absolutely no need for stretching the sphincter or dilating the anus, which very frequently means the tearing of some of the muscular fibers of the sphincter. A fine needle should be used and the solution should be injected slowly. The needle should not be permitted to reach or perforate the lumen of a fistulous tract, ulcer or other lesion, or puncture the skin or mucous membrane. This would permit the escape of the injected fluid, and would interfere with the success of the operation as far as the anesthesia is concerned.

Absence of pressure in any form of infiltration anesthesia prevents thorough anesthesia, and is a basic principle in local anesthesia.

Patients operated upon under local anesthesia can be operated upon at home, in the clinic, at the office or in the hospital. They do not require excessive pre-operative preparation; they are not restricted as far as food or drink is concerned, but are warned against taking cathartics or enemata immediately before operation.

When the patient is sent to the hospital, he is usually sent in at 7 a.m. after having had his breakfast, and is operated upon at 8 or 9 a.m. His regular meals are not interfered with, he is not tortured with the insertion of any rubber tubes or whistle, nor is it necessary to tie up his bowels with bismuth, opium or any other opiate for five to seven days. Instead of which, these patients have their dressings changed the day after operation, when they receive an oil enema and are encouraged to move their bowels the same day, and usually leave the hospital at the end of three days.

During the past year in a series of over 500 cases, I have used the circumscribed injection method of local anesthesia with the aid of novocaine $\frac{1}{2}$ per cent and adrenalin (1–1,000) three minims to the ounce. This represented about 95 per cent of all cases requiring operative interference that came under my observation. I use a general anesthetic only in those cases where extensive operations are to be done as excisions or resections, or where sutures are to be employed. Where I do not know in advance exactly what is to be done before operating, where there are any complications or conditions that would prevent thorough or complete work; or in the presence of pus, where the infection may be spread when injecting the solution for the production of local anesthesia.

Complete radical operations for external, internal and thrombotic hemorrhoids, fissure ani, ulcers, hypertrophied papillae, diseased crypts

of Morgagni, some forms of fistulae, some forms of prolapsus ani, polypi, impaction of feces and removal of foreign bodies, dermoid cysts, and the modified Ball operation for pruritus ani, can be successfully operated upon under the influence of local anesthesia.

Dr. Hirschman[3] states that it is his conviction that there is no case of hemorrhoids so severe that it cannot be successfully operated upon under local anesthesia, and he recommends as the standard anesthetic one of the successfully proven local anesthetics now so commonly used.

The object of this paper is merely to relate my experiences with what to me appears to be the safest and most reliable method of employing local anesthesia in rectal operations, and to elicit a sufficient amount of discussion so that we may be able to start some constructive work in proctology. Perhaps besides reading our papers and attending clinics at our meetings, we can get to a point where we definitely agree among ourselves. Then we can let the medical profession at large know that the American Proctologic Society has accepted this, that or the other method as the standard method of operating upon this, that or the other condition, or that we have accepted a certain method of local anesthesia, or a certain local anesthetic as the anesthetic of choice in certain rectal operations.

In conclusion I wish to state that:

1. Up to date, ½ per cent novocaine with 3 minims to the ounce of adrenalin is the safest and most satisfactory solution for the production of local anesthesia in anorectal operations.

2. The circumscribed injection of the anal tissues blocks the sensation areas most satisfactorily for complete anesthesia, and produces thorough relaxation of the sphincter muscles.

3. Stretching of the sphincter or dilating the anus becomes unnecessary.

4. The above method of anesthesia can be successfully employed in about 90 to 95 per cent of all anorectal ailments requiring operation.

DISCUSSION

Dr. William H. Kiger, Los Angeles, Calif.: I do not think there is much argument about the value of local anesthesia. I do probably 75 to 80 per cent of my private surgical work under local anesthesia. I use practically the same technique as Dr. Saphir has described, except that I do not use adrenalin. Patients have practically no pain. Over at the County Hospital, as I demonstrated to you, I do all my work under spinal anesthesia, but I use a local anesthesia at the same time. Of my other work 75 per cent is done under local anesthesia.

Dr. J. Rawson Pennington, Chicago, Ill.: If I think a local anesthetic will enable me to operate successfully I so inform the patient. In fact, I rather urge him

[3] Hirschman, L. J. *Transactions of the Proctologic Society*, 1920, p. 175.

to submit to it. For example, I usually employ from 6 to 8 drams of a 2 per cent procaine (novocaine) solution, to which has been added 7 or 8 drops of adrenalin 1–1,000 for the ordinary hemorrhoid operation.

In my hands a 2 per cent solution seems to give better results than a weaker solution. The weaker solution requires a greater quantity of it, which may "water-log" the tissues. However, if you can get satisfactory results by using the weaker solution, do so.

Dr. Arthur C. Crookall, Seattle, Wash.: I enjoyed Dr. Saphir's paper very much. There is only one point with which I can hardly agree and this was also forcibly brought to my attention at the clinic this morning. Dr. Pennington said he moved his patient's bowels on the second day and Dr. Saphir in this paper advocates moving them at least by the third day. In severe cases of hemorrhoids I do not move the bowels until the fourth or fifth day. I cannot see any advantage to be gained in moving the bowels over a raw surface as early as the second or third day. A primary principle in the healing of wounds is rest and you certainly do not give the operative area a very long period of rest when you disturb it with a bowel movement on the second or third day. The importance of rest in the healing of rectal and colonic diseases is emphasized when we make a temporary colostomy to give the lower bowel even months of rest. I do not see any particular advantage in putting a patient on a full diet as soon as he leaves the operating room. Most patients are improved by a week of fasting.

Dr. Louis A. Buie, Rochester, Minn.: Last year at the meeting in St. Louis I was much interested in what Dr. Zobel said about this particular technique that Dr. Saphir has just elaborated, so that when I went back to work I tried it out as best I could after the fashion he described. I found the method entirely satisfactory as Dr. Saphir has found it. I think one of the chief things that Dr. Zobel emphasizes in the use of his method of anesthesia, is the fact that the solution should be injected far in around the anal margin. By doing it in that manner the use of a large amount of solution, and the distortion of tissue are avoided. In other words, the "water-logging" that Dr. Pennington referred to, is not met with.

I would like to voice a sentiment at this particular time, which I think is most significant, and I feel that the value of the work that is being done by the different members of the society can be increased a hundred fold, if we will take cognizance of this fact. Dr. Zobel described this method last year. Dr. Saphir went back to his practice, has tried it out and has written a paper in order that we may know further of his experience in the use of Dr. Zobel's method.

Since we have been in Los Angeles we have seen two pieces of original work. One of these was described to us a year ago, and yet as far as I have been able to learn there is not a single man who has any added evidence either to substantiate or discredit this particular piece of work.

Dr. Kiger has given us a demonstration and told us more about something that he told us a year ago, namely, his method of the treatment of cancer of the rectum with Percy cautery. What is it going to avail the people who are sufferers with malignancy, if Dr. Kiger is going to be the only man to use it?

Dr. Kiger's clinic has afforded us a demonstration on the use of carbon dioxide snow in the treatment of stricture of the rectum. My suggestion is that some of us return to our activities and try these things out and give these men evidence to substantiate or discredit the work they are doing.

I think Dr. Saphir has sounded one of the chief features of progress in the work of a body of this character by taking up the work in his line and trying it out and seeing if it does any good and telling us about it.

Dr. Samuel Newman, St. Louis, Mo.: I have used local anesthesia for two years, and I quite agree with everything that has been said regarding it.

I would like to ask the author of the paper whether he has encountered intense pain and burning after the use of local anesthesia. This intense burning lasts anywhere from one-half hour to two hours, and what does he do for it?

Dr. Charles E. Howard, Cincinnati, O.: I am very glad Dr. Newman spoke of intense pain and burning. I have had it occur in some patients, but have never seen anything in the literature about it. I find that it takes half a grain of morphine to relieve these people, and its action is not prompt. I do not know the explanation.

Dr. Alfred J. Zobel, San Francisco, Calif.: After every operation upon the anorectal region the patient feels more or less pain, no matter whether the operation is done under general, spinal or local anesthesia. We must remember we are operating upon what are practically the most sensitive tissues in the body, barring, of course, the eye.

To my mind the intensity of the postoperative pain depends upon the temperament of the individual. At any rate I prepare my patients beforehand by telling them that they are going to feel some pain as soon as the effects of the local anesthetic wear off, and recall to their mind how after their leg has "gone to sleep," when sensation comes back, they feel most uncomfortable although nothing is radically wrong with the limb.

Of one thing I feel certain, and that is that the postoperative pain after an operation done under local anesthesia is of no greater intensity than after an operation done under general anesthesia. The former has the further advantage that the nausea and upsets which almost invariably follow the latter are a minus quantity.

When I have operated under local, at the time the dressings are being applied the patient is given a hypodermic injection of one-sixth to one-fourth grain of morphine, guarded with atropine. This eases, and in some cases stops the pain which comes with returning sensation.

As a rule I do not give morphine and atropine before I operate. I find that patients go on the table just as calmly without it. In fact the majority are far better off without it, as it causes nausea in some, while almost all of them complain of the excessive dryness of the mouth from the atropine.

Dr. Saphir has been kind enough to credit me with some originality in the technique I employ in my operations under local anesthesia. I, in turn, must give the credit to others, for what I do is simply a composite of the best I have seen among the Fellows of this Society at various times in my travels over the country.

The main point in the technique which last year I brought before this Society is that if you wish to get a perfect anesthesia of the tissues of the anal canal (the really sensitive tissues, for the rectal tissues are practically insensitive), the anesthetic solution must be injected close up to the anal orifice. Then you do not have to inject deeply into the anal muscles. It is rarely necessary to use more than six to eight drams of solution to get a perfectly satisfactory anesthesia. I use a one-half of one per cent solution, with three drops of adrenalin solution to the ounce.

Dr. Pennington: You say you inject the solution around the margin, that is, at about the external border of the anus. Is that right?

Dr. Zobel: Yes.

Dr. Pennington: Supposing you have quite extensive external hemorrhoids to deal with, does the solution anesthetize those areas at the same time?

Dr. Zobel: It makes no difference how far out you inject afterwards. But you must first anesthetize the tissues at the anal orifice, as I have tried to describe.

Dr. William M. Beach, Pittsburgh, Pa.: Do not let us forget a little of our anatomy in connection with anesthesia. At the right and left posterior lateral quadrants the anal nerve or anal branch of the pudic nerves passes in, and these are the most particular points you must anesthetize. Insert the needle posteriorly and in that direction on either side, and if you do not do any more than that you have the patient three-quarters anesthetized. You must not forget that there are anterior anal nerves, and that part should also be anesthetized. I mention this point as an anatomic feature. The solution should be made fresh.

Dr. Ralph W. Jackson, Fall River, Mass.: I do the most of my surgical work under general anesthesia, because, with rare exceptions, my patients come to me with a demand for that; and, even in cases where I prefer to use local anesthesia for good and sufficient reasons, I often have to dissuade them from general anesthesia with considerable vehemence, and do a lot of explaining. Apparently this is different from the experience of many of you, but why it is, I do not know.

Dr. Saphir (closing): I want to thank the Fellows for their thorough discussion of my paper. The object of my paper was to elicit a free discussion with the hope that we might standardize certain methods and procedures as coming from this Society. Let us take the chart of Dr. Pennington as an instance. I think it is high time that our Society should have certain methods and procedures standardized so that they can be utilized by the medical profession at large, and it should know that such a society exists. It seems to me, we should be able to do something along that line.

I am going to answer some of the questions that have been asked. Dr. Crookali wanted to know whether the patient's bowels should be moved the next day or on the second day after operation. It makes no difference. You do not have as large a raw area or surface as you think. My patients are given an oil enema or mineral oil at night, followed by a dose of castor oil in the morning, and the bowels move on the third morning; i. e., forty-eight hours after the operation they are given castor oil, and the bowels move within a few hours, and then there is no necessity for them to remain any longer in the hospital.

With reference to putting the bowels at rest, there is no necessity for that when you do the operative work under local anesthesia. Patients feel comfortable. There is no reason for interfering; these individuals can fast and keep away from food for five or ten days, and it does not materially interfere with their well-being. If their bowels move it is better than to have them on a diet; they have greater pain from a dry, small scybalous mass which settles down in the rectum. When they have sufficient food, with a lot of residue, they have a better formed fecal mass, and can more readily expel it. Hence they feel more comfortable.

In reference to the intense pain and burning following local anesthesia, you get that following any operation on the rectum, whether you use spinal, local, or general anesthesia. I have not had occasion to give my patients more than one dose of one-sixth or one-quarter grain of morphine immediately after operation. Usually I wait until I get down from the operating room. When I go from the operating room and

visit my patient, the patient is given one-sixth or one-quarter grain of morphine, depending upon the size and condition of the individual.

Another important feature about local anesthesia is that male patients as well as females are able to void. It is not necessary to catheterize them as frequently as you would if you gave them a general anesthetic.

I cannot say anything about spinal or sacral anesthesia, because I have never used it.

THE AMBULANT TREATMENT OF ANORECTAL FISTULA

Arthur Crookall, M.D.

SEATTLE, WASH.

By the above title we mean the treatment of certain types of anorectal fistula by recognized and accepted surgical means in such a way that the patient can pursue his ordinary vocation during the period of treatment. We say recognized and accepted surgical means for the reason that no other satisfactory method of treatment has yet been discovered and because the surgical treatment of this disease is curative when properly applied by a competent surgeon who has made a special study of this complex and often very difficult disease. The results from any other method of treatment are very uncertain and only occasionally give good results.

Much time has been spent in experimentation and study by different members of the American Proctologic Society on the different nonsurgical methods of treatment for this disease. Joseph Mathews introduced the fistulatome; James Tuttle experimented with the injection of escharotics; J. Rawson Pennington put the use of the seton on a scientific basis, and other members have done useful work on electrolysis, cataphoresis, etc. But each and every one has always contended that the surgical treatment is the only satisfactory method and that the other means are merely adjuncts, though extremely important ones, in certain complicated cases.

The ambulant treatment of fistula by surgical means has been made possible by the perfection of local anesthesia, and simply consists in doing our regular operation in several steps, so that the area of raw tissue exposed at any one time will only be of such extent as will justify us in allowing the patient to be up and about after each treatment, and thus throughout until a cure has been affected.

Operating by steps is nothing new in surgery. It is a recognized method and is used in several grave conditions, which can be easily

called to our mind, being usually employed in run-down conditions or where a too extensive one step procedure might endanger the patient's life.

The program of this Society only last year included a valuable paper by Dr. Louis Hirschman, in which he advocated the use of the multiple step operation in certain complicated and extensive fistula cases, for the purpose of conserving the patient's health and for the better plastic results to be obtained.

In the type of cases suitable for the ambulant treatment the question of the health or strength of the patient or the ultimate plastic results rarely enter. They are always cases suitable for a one step operation, which as far as the surgeon is concerned, is the method of choice.

The reasons for its use lie within the patient himself and are pretty well covered by three groups. First we have the individual who in an important managerial capacity is unable to take even a short vacation or an employe who dare not lay off for fear of losing a position. Second, the poor person having dependents, who cannot discontinue his work nor pay a hospital bill. Third, the psychologic or psycho-pathologic group which includes all those who have a horror of the knife, the operating table, the hospital, general anesthesia, etc. We naturally feel impatient with this group, but they are often not to blame for their unreasonable fixed ideas and they can usually be handled by the ambulant treatment if proper tact be used.

The following short histories are illustrative of the above conditions: Mr. A. in charge of a large ship building plant during the war was sent me with a diagnosis of a rectal fistula. He was an apparently healthy man of fifty-two and was putting in sixteen hours work a day. He told me his rectal trouble was more a worry and nuisance than anything else and wanted to know if anything could be done outside of a surgical operation, as it was impossible for him to lay off a day.

On examination I found a small discharging sinus on the right side of the anus just anterior to the mid-anal line. A cord-like induration passed back to the posterior median line. Examination of the anal canal showed no pathology and the injection of methylene blue showed no internal opening. On further examination it was evident that the cord-like induration passed back to the neighborhood of the coccyx where there was a depression indicating that the fistula originated in a post-anal dimple. I informed the gentleman the affair could be handled by office treatments and opened the tract for ¾ of an inch the first visit. The tract was followed up by four more incisions at weekly intervals, when the cutaneous hairy sack of the dimple about the size of a pea was reached. This was excised with partial suture.

Mr. X. a banker, aged sixty-two, in good health, presented himself with a fistulous opening three inches anterior to the anus and slightly to one side of the median raphe. A blunt probe could be passed back to the margin of the anus. Examination of the anal canal showed an opening almost at the anterior commissure at the pectinate line, which was confirmed by the injection of methylene blue and peroxide. There was no history of abscess in this case, although the patient said the parts swelled and were tender at such times as the fistula was not discharging. A grooved director was passed into the track and an incision half an inch in length was made just anterior to the anus, leaving about one and a half inches of the anterior portion of the track intact. This was subsequently treated by the passage of a probe upon which was fused silver nitrate. Starting from the first incision the track was carried back to the internal opening in four more treatments without any real inconvenience to the patient.

In this case the fistulous track passed through part of the external sphincter muscle and had originated at the base of a rectal pocket.

Mrs. Z, aged seventy-two, came to the office with a large subcutaneous abscess on the right buttock two and a half inches from the anus about on the mid-anal line. This was incised with a crucial incision. Subsequent examination showed this woman to be suffering from a complex superficial fistula with five external openings, four on the right side and one on the left. There was an internal opening slightly to the right of the median line at the usual location, the main track passing between the superficial and deep portions of the external sphincter. Considerable scar tissue was present on the right buttock, a monument to a previous ineffectual operation. This old lady informed me that she could not afford to go to the hospital and as she had carried her trouble for eight years she would have to make out the best she could, as from results of her first operation she had her doubts of their value. I treated this old lady for four months by short weekly incisions until the entire condition was completely healed and at no time was her work interfered with, nor did she suffer the slightest inconvenience outside of adjusting her pads and taking her sitz baths.

The one important point to be taken into consideration in the selection of our cases for treatment is the determination of the anatomical relations of our fistulous tracks.

The first question we have to ask ourselves is where and how did the fistula originate? What was the nature and location of the preceeding abscess? If the original abscess was perirectal or ischiorectal, the disturbance will have been so great that the patient will remember the symptoms sufficiently well to give us an idea of its origin. If the fistula

has been preceded by an ischiorectal abscess, it is of the deep type and will not be suitable for ambulant treatment.

If the patient does not remember a preceding abscess, or if it was small and close to the anus and not associated with fever and chills, we can be fairly sure our fistula is superficial and suitable for ambulant treatment.

The next point to determine is the location of the internal opening. If it is in the anal canal below the pectinate line it usually means a superficial fistula, or following Pennington's classification, an anal fistula.

If at the pectinate line it is an anorectal fistula and may be either superficial or deep, and if above this line, we have a rectal fistula which is apt to be of the deep type.

Proceeding now with our physical examination we should be able to determine exactly what the nature of the fistula is. This is sometimes easy in short, straight, superficial tracks and can be determined merely by the passage of a probe and digital examination. It is often very difficult in complex cases and may require several examinations, using different kinds of probes, the injection of colored fluids, or the injection of bismuth paste, followed by stereopticon *x*-ray pictures. But no matter how much study the case takes I believe the surgeon, before beginning treatment of any kind, should have a complete mental map of the fistula with all its tracks and their relations.

A point that does not seem quite clear in some of the literature on this subject is the relation of complete fistulous tracks to the external sphincter muscle. The external sphincter muscle is really composed of two parts, which might be called the superficial and deep. They are separated by a fibrous extension from the longitudinal muscular coat of the bowel which passes out fan-wise and is inserted in the skin at the anal margin and really forms a dividing line, at least laterally for the superficial and deep infections.

The route taken by a superficial fistulous track is between the anal skin and the superficial external sphincter or following the longitudinal fibers, between the superficial and deep portions of the external sphincter, while in the case of a deep fistula the main track usually passes between the internal and external sphincters and thus into the ischiorectal space. The superficial portion of the external sphincter can be incised with impunity.

Goodsall and Miles, in speaking of the treatment of those cases of fistula which pass between the superficial and deep portions of the external sphincter, give the warning that after incising the superficial portion of the external sphincter underneath which our fistulous tracks run, we should turn our knife and incise the balance of the muscle

beneath the track, for otherwise in their opinion the incision is apt not to heal; they refer to this incision as the original Salmon back incision.

The advice of any of the surgeons of St. Marks is entitled to the highest respect and in doing a one step operation I always follow this procedure, but in doing the multiple step operation I have not followed this method in spite of which the results have on the average so far been good.

On the other hand, when the fistulous track is so superficial that it passes between the anal skin and the superficial portion of the external sphincter; in other words when it does not pass between any of the fibers of the external sphincter muscle, I think it a good plan to make a back incision sufficient in extent to sever at least the fibers of the superficial portion of the external sphincter muscle, and thus improve our drainage, the *sine qua non* in the treatment of all these cases.

The deep or main portion of the external sphincter muscle is misnamed, for it is not a sphincter muscle at all. It helps in the closure of the anal canal, but does so by lateral compression, acting in much the same way as the levator ani in the upper portion of the canal. In fact a sphincter muscle could not possibly close a canal of this size. If we take a good size rubber tube and endeavor to close its caliber by constricting it by surrounding it with a tight rubber band (a constrictor), it will be found very difficult to close, whereas its lumen can be obliterated with the greatest ease by squeezing it between the thumb and finger by lateral compression. The internal sphincter is the only real sphincter we have, and its function appears to me to be simply a delicate approximator of the upper portion of the anal canal, probably aiding in the control of gas and liquid feces and being entirely dependent for support on the lateral compressive action of the internal sphincter and levator ani, without whose action it would be entirely helpless.

Therefore, in operating on superficial fistulae, the question of incontinence need never be considered, for as long as the powerful lateral compressors of the anal canal and the fibrous splint which connects them is not interfered with, no harm can be done. The explanation of this matter was first brought out in a paper[1] by Dr. G. B. Evans and also an article on the same subject by Dr. Louis Krouse.

Occasionally patients with superficial fistulae will also have external or internal hemorrhoidal varicosities, enlarged papillae, cryptitis, or a combination of these things, requiring a general overhauling of the anal canal. In such cases I usually insist on a one step operation to clean up the entire trouble; for if the fistula be cured and the other abnormal conditions be allowed to remain, the results will not be satisfactory.

[1] Evans, G. B. Incontinence following Rectal Operations. *Transactions of the American Proctologic Society*, 1910.

In regard to blind external superficial fistulae, I have nothing to say. I consider every such fistula to have at least a potential internal opening and treat it as such. They are uncommon.

Blind superficial internal fistulae on the other hand are quite common and are much more difficult to handle than the complete. In cases where the track runs downward along the anal canal a hooked probe is passed so that its tip can be felt under the skin on the anal surface. A counter opening is here made, transforming the fistula into the complete form and then treated as such. In blind internal submucous fistulae, in which the track of course runs upward, a groove director is inserted, using a large caliber anoscope and the mucosa incised over the director preferably with a fine electrocautery point.

It is not necessary to go into any great detail in regard to the technique of treatment before members of this organization. The following is the usual routine followed by me in treating such cases: Once a week, preferably on Saturday, after the patient is through for the day, I incise the fistulous track for half or three-quarters of an inch, using novocaine local anesthesia, starting from what seems to be the main external opening. A groove director of very small caliber and a narrow bladed knife are usually necessary, as these superficial tracks are often of very fine caliber. A small piece of gauze is placed between the lips of the wound and held in place by passing it a short distance up the fistula. On Tuesday the gauze is removed, if it has not already fallen out, and a small strand of gauze is placed in the inner end of the cut, leaving the outer portion of the cut to heal. By the next Saturday the former cut will granulate over and the treatment is repeated until the inner opening has been reached. Where there are several branch tracks and openings I start on what appears to be the main track, and when an offshoot is reached this may be followed out at the same time, so that two incisions are made at each treatment, thereby saving time.

In order to keep the trauma to the minimum the wall of the track incised is not interfered with and it will be found that this readily forms the floor of the scar remaining after the treatment is over. I have now a case in which this scar tissue has broken down a year after treatment, forming a small external sinus which ought to be excised. The patient wears a dressing of plain gauze during the day and takes a hot sitz bath night and morning. Out of fourteen cases treated by the above method I have had perfect results in eleven. Of these cases two had had one previous hospital operation, and another two operations.

Of the three cases in which the results were not perfectly satisfactory, one has been mentioned and was a straight, complete lateral sinus one and one-half inches in length, situated in the mid-anal line.

The other two cases were situated in the posterior commissure. One of these was a straight complete fistula about one and a half inches in length, opening internally at the usual place in the posterior commissure. The track healed nicely except that portion in the anal canal. The patient refused to have the scar tissue excised, and it was only after several months of intermittent treatments by cauterization that this little area could be made to heal. The other case was a blind internal fistula in the posterior commissure. The track was less than half an inch in length. It was turned into a complete fistula in the ordinary way and incised. The condition recurred in a month, when it was excised under gas and has since given no trouble.

The reason that we are apt to have trouble with the healing of even a simple fistula in the posterior commissure treated by incision alone is due to the anatomical relations at this point, and it is due to the same reason that we sometimes fail in posterior median incisions for fissure. This matter has been so frequently discussed in this Society, I do not think it is necessary to discuss it further, except to say that in treating a fistulous track passing up the posterior commissure in which much scar tissue is present, we can expect to have trouble with the healing of our wound.

Conclusion. The treatment of superficial types of fistula surgically, by the ambulant method, is legitimate and satisfactory. It is not the method of choice of the physician in any except the simplest cases. There are certain conditions and circumstances that demand its use on the part of the physician. Its use is not as satisfactory in the posterior commissure on account of the anatomical relations of the parts.

DISCUSSION

Dr. Joseph F. Saphir, New York, N. Y.: I personally never tried the two step operation for fistula. I perhaps am a little more radical in this respect than some of you. When I get hold of a fistula, I treat it at one sitting. If the fistula is so extensive that the operation cannot be done successfully under local anesthesia, I use synergystic analgesia or give a general anesthesia. In some cases I find that the operation could have been done under local anesthesia. For instance, let us take a laborer. When he gets through with his work on Saturday afternoon, one can operate on him under local anesthesia, giving 0.5 per cent novocaine and three minims of adrenalin. If you inject the solution an inch or two inches beyond the anal opening, you can inject the entire anal canal to a sufficient extent so that you can make your incision. If you wish to do this in your office, you can do so very easily. You can send the man home in a taxicab and he can attend to his work on Monday. The same thing can be done if a patient is sent into the hospital.

There is one point to which I think it would be wise to call attention, and that is this: Very frequently the tract will feel hard, indurated, and thickened. It is only an induration of the canal, and some have mistaken this for the sphincter muscle and

have been afraid to cut into it. That is an important point to remember in doing fistula work. I have not seen any cases of incontinence. If you should cut the sphincter muscle, you must cut it at right angles irrespective of the part of the sphincter you cut, whether anteriorly, posteriorly, or laterally. You can cut the skin and underlying tissues in any direction, in a circular manner or in a curved direction, provided that when you get down to the sphincter muscle you put your grooved director in a line perpendicular to the sphincter muscles and cut through. You will not get retraction of the ends of the muscular fibers and that will prevent incontinence.

Dr. J. Rawson Pennington, Chicago, Ill.: The outlet of the bowel is controlled by the tonic contractions of the external sphincter and the levatores ani muscles. These contractions produce the perineal flexure. The best ambulatory method of operating on fistula of which I have knowledge is my restriction or seton method.

Dr. Alfred J. Zobel, San Francisco, Calif.: I am very glad that Dr. Crookall had the courage to read this paper before this Society, because many feel that a fistula is an operative case, which should be completed at one sitting. Yet Dr. Crookall assures us that he gets excellent results in ambulatory office cases by taking his time, and if he says so it must be so. All of us have patients who simply find it impossible to stay away from their business or employment. It is with these patients that the ideas of Dr. Crookall are of the most value, and I am going to try them out in the future.

Dr. D. C. McKenney, Buffalo, N. Y.: Dr. Crookall has called our attention to a method of treatment which we all ought to try, although we cannot always handle our patients by the ambulatory method. One particular feature that is important in operating on a fistula that opens into or above the perineum is that we should do a two-stage operation; making an incision from the external opening down to or partly through the sphincter ani externus and putting a seton around the uncut portion. The incision cuts partly or wholly the transversus perineal muscle (of more importance in the female than in the male), but the uncut external sphincter holds the ends in good apposition until the wound heals from the bottom up and, when this part of the healing is accomplished, by tightening the seton or by incision, the sphincter is severed and the balance of the wound readily heals. I have done this a great many times and I think generally the results are better than by completing the operation at one time.

One method for finding the internal opening and side-tracks that I employ and which has helped me in a lot of such cases is this: The fistulous tract is injected with sterile ice-water and with the bare finger in the anal canal one can readily feel with exactness just where the ice-water comes through, and, by injecting the cold water under pressure, a bulging and sensation of coldness is imparted to the finger over a side-track. Even with the internal opening found and the side-tracks eradicated the fistula will not be cured unless associated pathology is also removed, such as hemorrhoids, hypertrophied anal valves and polypi located near, as well as opposite, the internal opening, as these act as mechanical blocks to perfect healing.

Dr. Arthur Crookall (closing): There is only one point brought out in the discussion to which I wish to refer and that is the advisability of destroying the floor or wall of the sinus with carbolic acid or silver nitrate after opening it. I have tried it both ways and in these superficial cases it has seemed to me unnecessary. It has even seemed a disadvantage in that it increases the amount of raw tissue which is what I try to avoid in ambulatory cases. The fibrous tissue composing the wall of the

opened sinus forms the base of the wound and being close to the surface it soon loses its pyogenic character. Of course I realize the importance of excising or destroying the wall of the sinus in deep-seated tracks for in these cases the scar tissue acts as a foreign body and makes the healing of the incision extremely slow or causes a recurrence.

POLYPS OF THE RECTUM AND LARGE BOWEL

Charles E. Howard, M.D.

CINCINNATI, O.

The first case of rectal polyps was reported in 1721 by Menzel, in a boy aged fifteen years. This was a case of multiple polyposis that resulted in death. Since that time many cases have been reported and the condition is well recognized.

According to MacCallum a papilloma is a tumor of lobulated, branched or papillary form in which each fold or offshoot of the epithelial layer has a central core of connective tissue with blood-vessels. An adenoma is a tumor composed of glands of tubular, acinus or other forms embedded in a vascular stroma. An ordinary polyp is frequently a combination of papilloma and adenoma. Depending upon the absence or preponderance of adenomatous tissue a polyp will be either of the hard papillomatous variety or the soft adenomatous variety.

In a résumé of the literature by Doering and Soper it appears that males are affected with polypoid disease more frequently than females in the ratio of two to one, that the condition is most frequent in childhood and early adult life up to the age of thirty-five years, though cases are reported at all ages. In their study of the cases that went to operation 43 per cent had undergone malignant changes. The soft adenomatous variety most frequently undergoes malignant change. The hard variety rarely becomes malignant. Tuttle stated that he had never seen a well pedunculated polyp become malignant.

The cause of this condition is not definitely determined. It is in all probability due at least in some manner to chronic irritation, i. e., chronic inflammation either localized or diffuse. Rokitansky believes that polyps arise from the margins of dysenteric ulcers. Meyer believes that they are a result of congenital malformations of the intestinal wall involving the mucosa and submucosa. Struthers claims that ulcerating colitis and infection are causes. Tuttle very aptly describes the condition by stating that a polyp is a tumor attached to the rectal wall by a pedicle and that it results from a blocked follicle or gland distended because of inflammation and hence protruding into the lumen of the bowel carrying

the mucosa with it and dragging a submucosa after it. To those who have seen polyps develop in cases of chronic inflammation or recurring inflammation of the mucosa there is little doubt that the predisposing factor is inflammation. The most common sites of the disease are the rectum, the sigmoid and the splenic flexure in the order named. Polyps are often single, but where one is found, diligent search for others should be conducted because they are very frequently multiple. In cases of multiple polyposis the tumors are too numerous to take account and frequently involve the entire colon. In this condition they do not attain as a rule to as large a size as when there are but a few present.

The treatment of polyps is chiefly surgical or in cases of multiple polyposis surgical combined with medicinal. Removal of polyps in the rectum is quite easily accomplished. When they are higher up it is a different matter and colotomy may be necessary. Dr. Buie has recently reported a new compression clamp which may be used through a long sigmoidoscope successfully. There are a few cases of large polyps high up in the bowel causing intussusception with obstruction successfully treated by colotomy and removal of the growth. Recently such a case was reported in the medical literature. A young girl with acute obstruction in the descending colon had it successfully removed; a few weeks later this case had a recurrence and the surgeon operating found another polyp in the transverse colon and still a third one closer to the cecum. This case made a nice recovery.

Characteristic symptoms of polyps are bleeding, passage of bloody mucus with tenesmus, sometimes frequent stools with straining, and often a sensation that even though the bowel is empty there is still something to pass.

While acute, recurring and chronic coloproctitis is undoubtedly a predisposing factor, at least in the development of polyps there are many cases of chronic irritation which do not develop trouble. Just why some do and some do not is undetermined.

Case Report. A woman aged sixty-eight years, very active, previous history negative, whose chief complaint was the passing of stools composed of blood and mucus every ten to fifteen minutes, had a sensation of weight and discomfort in the pelvis with much tenesmus. The previous x-ray diagnosis was cancer of the rectum, due to an apparent stricture showing in the upper rectum. Examination showed unrepaired, a large perineal tear of forty years standing with marked rectocele, slight cystocele and some prolapse of the uterus. Through the proctoscope a very large polyp with a thick pedicle was seen, attached just above the third valve. This quite completely occluded the lumen. It was removed with a snare. Subsequent examination showed another polyp about an

inch above the site of the first one and about one-half times as large. It was removed in like manner. There followed almost complete relief of the symptoms, the patient occasionally complaining of small amounts of bloody mucus. Examination with the longest sigmoidoscope was negative. A polyp higher up was suspected and potassium iodide was used on the patient and kept under observation. There were occasional attacks of diarrhea lasting a day or so.

DISCUSSION

Dr. Alfred J. Zobel, San Francisco, Calif.: I would ask Dr. Howard to tell us to which wall of the bowel the anterior or the posterior, the polyp was attached, because there is considerable danger attendant upon snaring one which is attached to the anterior wall, high up, on account of the possibility of a dipping in of the peritoneum at that point.

Dr. D. C. McKenney, Buffalo, N. Y.: I have three cases to report: One patient, thirty-five years of age, very much emaciated, from whom I had removed at different times during a period of two months ten polypi, two of which were reported as malignant and the others non-malignant. In one child, twelve years of age, I found a polyp the size of a small hen's egg with a pedicle over one and one-half inches long. He had also two other sessile ones. In another child, about a year old, there was much more hemorrhage than in the case of the previous one and one sessile polyp was found. I cauterized this about two weeks before I left home but I do not know the result in this case. The first case mentioned died and the second one, after a lapse of five years, has had no trouble and is freed from polypi for eleven or twelve inches upward as shown through the sigmoidoscope.

When one polyp is found search for more should be made. If multiple polypi are discovered one or more is quite certain to be malignant. After polypi have been removed the patient should be reexamined at intervals of six months or a year to guard against reoccurrence.

In snaring polypi I wish to call attention to an accident that may happen unless care is exercised. A polyp located high in movable bowel, covered by peritoneum, is apt to prolapse a considerable distance, even coming out the anal orifice, at the same time pulling into the lumen of the bowel a funnel-shaped area from the peritoneal side, thus greatly lengthening the pedicle which, if snared too close to the bowel wall, may cut across the funnel and open the peritoneal cavity.

Dr. Ralph W. Jackson, Fall River, Mass.: I would like to know if there is any one here who has had an actual instance of a ligature cutting through into the peritoneum and exposing it to infection before a polyp, which has been ligatured, has dropped off. It would seem to me that adhesive inflammation from the pressure of the ligature ought to seal up any such peritoneal prolongation into the pedicle of the polyp before that drops off. I can better understand how such a thing might happen if a polyp were snared and not ligatured.

Dr. Descum C. McKenney, Buffalo, N. Y.: It was of snaring that I was speaking and not of ligaturing, which I do not think would cause the trouble.

Dr. Frank C. Yeomans, New York, N. Y.: This is a very important paper because we have to differentiate two distinct conditions. Multiple polypi of the

rectum is one of these and when we remove these localized polyps the patient is well. In the other condition known as adenomatous polyposis, the tumors are usually distributed throughout the length of the colon but may be found in the terminal ileum and even in the stomach and duodenum. Usually they are limited to the colon. This is recognized as a distinct condition, the cause of which seems clearly to be irritation as Dr. Howard has pointed out. In the cases I have seen the irritant was an infection, as amebiasis. In other cases there is no history of dysentery, but the condition seems to originate *de novo*. Many years ago Dr. Tuttle reported to this Society a very instructive case of a child five years of age, on which he did an ileostomy, putting the colon out of commission. After the operation, the adenomata, which numbered thousands, receded and disappeared, as observed by proctoscopy. They had receded so far, and the child did so well, that in about a year or eighteen months, the parents insisted on having the ileostomy closed. A short time after closure infection from the feces occurred again with prompt recurrence of the adenomata. If these cases are not promptly treated surgically I believe every case of the soft adenomatous variety will become, sooner or later, adenocarcinomatous, and then they are hopeless. Therefore, we have a definite principle of treatment. If they cannot be removed locally, on account of being too many and inaccessible, the thing to do is to resort to an enterostomy at a point above the growths. If limited to the sigmoid, a transverse colostomy will suffice, but if they are higher up, in the ascending colon or cecum, ileostomy is indicated. The other effective procedures are an ileorectostomy, an ileosigmoidostomy, or removal of the colon. Several years ago Lilienthal[1] of New York reported a successful case in an adult in which he did a colectomy. These cases are rare, but when they do occur, both physician and surgeon are at a loss as to treatment. There does not seem to be an established principle of therapeusis in these cases. If you accept the principle outlined, and I believe it is the correct one, there can be no doubt as to the advice to be given in these very serious cases.

Dr. J. Rawson Pennington, Chicago, Ill.: Since the consensus of opinion is that cancer never develops in healthy tissue and that chronic irritation is a predisposing cause, I wish to state a few facts and draw a conclusion therefrom.

It cannot be gainsaid that scar tissue follows surgical procedures, that cancer occurs in scar tissue, that cancer may develop in a hemorrhoid, that cancer may develop in pruritus ani, that cancer may develop in a fistula, that cancer may develop in a fissure, and that cancer may be engrafted on proctitis.

In view of these facts, one of the most important factors to keep before the medical and public eye is that every individual who has reached the cancer age should have periodic proctologic examinations made.

Dr. William H. Kiger, Los Angeles, Calif.: I always take these polyps off with a small cautery in place of snaring them. It is much easier to do and it can be done at the office without an anesthetic. I have a long electric cautery that I use through a one-half inch proctoscope, if necessary, and I find that is the easiest way to take these polyps off, and there is less danger. Recently I have had several of these cases, and that is the way I have treated them and have carried out this treatment for a number of years. I consider the cautery better than the snare.

Dr. Newman, St. Louis, Mo.: It has been asked whether any one has seen any untoward effects from the ligation of the pedicle of a rectal polyp? A case came to

[1] Lilienthal, H. *Ann. Surg.*

my notice some years ago in which an attempt was made to ligate the pedicle of a polyp which was situated some five inches from the anal orifice. The pedicle was rather soft. The attempt to ligate the pedicle was unsuccessful. The surgeon felt that possibly it would take care of itself. Hemorrhage resulted and peritonitis closed the chapter for that patient. I think those cases should be very carefully considered before being attacked through the rectum.

Dr. Gregg: I would like to ask Dr. Kiger whether in doing the cautery operation he cuts close to the larger portion?

Dr. Kiger: Close to the base.

Dr. Gregg: Have you ever cut through or experienced any trouble in so doing?

Dr. Kiger: No. I have the field well lighted. It rarely ever requires more than one treatment.

Dr. Howard (closing): Where the polyp is situated high up it is snared off very slowly close to the rectal wall. The snare is put on one day and does not cut through until two days later. In the case I mentioned the pedicle was too thick to snare off quickly.

I am very partial to the use of the cautery, and where the polyps are low enough down they can be removed with the cautery successfully. I have used the snare and have cauterized the base which is left where the snare has cut through.

In regard to the development of carcinoma at the site of the polypus years after it has been removed, I question whether the polypus has been removed completely a number of years previous, if there is a recurrence following its removal.

TUBERCULOSIS OF THE ANUS AND RECTUM

William M. Beach, M.D.

PITTSBURGH, PA.

The incidence of tuberculosis in the terminal portion of the alimentary tract is of such relative frequency that a brief review for the annals of this society seems to be warranted.

To approach the subject in an orderly manner, our attention is directed first to its nature and onset. Briefly defined, tuberculosis is the bacillus tuberculosis in a state of proliferation in the body. Its invasion is insidious, and generally symptomless during the period of efficient bodily resistance.

The apparent frequency of the affection in succeeding generations of families was clearly recognized in the older conceptions of tuberculous disease, and this intrenched the idea of its hereditary transmission upon the medical profession as one of the most unassailable features of the condition. In the light of modern teaching, the idea of heredity has given way to its essentially infectious nature. The adherents of Koch insisted that for clear proof of inheritance the disease must be shown

present in the fetus at birth either in a certain degree of development or the germs of the disease must be demonstrated in the fetus or the fetal annexa. Postnatal acquirement from the tuberculous parent or other source was insisted upon.

Again as the disease may be unrecognizable in early life, there may be transmitted a certain diathetic or constitutional defect providing a nidus conducive to the proliferation of the bacillus. The pendulum swung strongly in this direction for a time, but more recent observers take a middle ground and declare that while there are undoubted cases of direct transmission from mother to the child, they are rare. On the other hand the consensus of opinion prevails that the disease is one of the many infections. Further the idea is steadily gaining that among the cases presenting a hereditary transmission of a predisposing structural peculiarity, as scrofula, there are a greater or less proportion of actual tuberculous changes existent or perhaps the tubercle bacilli in a latent condition. If we accept such a view, our opinion of the onset or origin by way of heredity must be correspondingly broadened.

TISSUES THAT ARE VULNERABLE

Lymphatic glands, bones, joints, kidneys and the peritoneum are the most frequent tissues attacked by the tubercle bacillus. The respiratory and digestive tracts are the great portals through which tubercle bacilli may invade the blood stream. Whether they are destroyed or find a nidus in some organ and there develop, will depend upon the number and virulence of the bacilli, and the resistance of the host.

In the beginning process of infection the bacillus will invade the lymph nodes of the mesentery directly from the intestinal tract without any evidence of injury to the mucosa. It is well known that hydrochloric acid in the stomach is a deterrent to the tubercle bacillus and only when the organism is swallowed in large quantities will some escape into the intestine. Since we are concerned only with tuberculous processes in the intestinal tract, our remarks will be limited to the consideration as it relates to the lower bowel and anal canal.

It is my belief that as the resistance is lowered by the tubercle bacillus in the lymph and blood streams, the intestinal mucosa becomes a vulnerable tissue to its destructive process. This is not necessarily primary but may be secondary to mixed infections charged to the streptococcus, staphylococcus, colon bacillus and their various strains.

When one considers the embryologic history of the recto-sigmoid apparatus and the anorectal junction, it is easy to understand these

structures as points of predilection to the invasion of germs. The coalescence of the post-allantoic gut with the hind gut forms the recto-sigmoid strait, while its union with the proctodeum forms the pectinate line. Both these areas contain sinuses and crypts that may receive bacteria including the tubercle bacillus.

Dr. I. H. Alexander of Pittsburgh, who did eminent service during the world war personally stated to me that 98 per cent of the soldiers suffering from pulmonary tuberculosis showed involvement of the sigmoid and rectum. This is based upon post-mortem examinations.

This is evidence that these processes are secondary to pulmonary or constitutional involvement, primary tuberculous infections of the anus and lower bowel being very rare. My own observations in cases of this nature confirm this rule for in the last five years, all such numbering eighteen, showed pulmonary initiative. One of my recent patients typifies this class. The following is a record from The St. John's Hospital:

Case I. D. B. aged thirty-five, American, white, farmer, complained chiefly of purulent discharge from the rectum. He was admitted March 17, 1922. Present condition began about eight years ago, and at that time a discharge from the rectum was noticed, yellow in nature on clothing. The discharge became progressively worse and continuous and made the patient very miserable and unable to get about well. The yellow discharge was always streaked with blood. This was noticed on the clothing. The patient noticed slight bleeding with pain after defecation. At times he complained of slight itching. Bowels moved two or three times a day. The patient was operated upon for his present condition eight times. His appetite was fair but he complained of distention with gastric eructations after meals. He had continual hawking but no actual cough. His weight loss was fifty pounds; normal weight 185. His mother died from the same disease. He drank little tea or coffee, but took no alcohol. He has slight bleeding from throat, but no pain. He complains of palpitation, night sweats, dyspnea on and off. The perianal region showed several openings through which sanguino-purulent material exuded, a flabby patulous anal canal with evidence of much destruction of subcutaneous tissue including the ectal and ental sphincters with accompanying incontinence.

The bacteriologist reported tubercle bacilli both in the sputum and the anal discharge. This was a clear case of systemic tuberculosis with its chief manifestation in multiple abscesses in the anorectal region resulting in multiple fistulae.

To relieve his condition a little, we performed colostomy March 20, 1922. We also cauterized the ulcers which were later exposed to heliotherapy and gave supportive treatment. He improved for a time

only to relapse into the usual course of general tuberculosis and died in August.

VARIOUS FORMS OF THE TUBERCULOUS PROCESS IN THE LOWER BOWEL AND RECTUM

By far the most common expression is ulceration. The ulcers having rather ragged edges and giving off a mucopurulent product which may be but rarely tinged with blood. The anal structures are rather flabby, the orifice, patulous and the crypts, inflamed, the pockets easily exposed and bathed with an ichorous discharge.

A second form appears on the perianal skin of the verrucose variety beginning as a small wart or may be a blister and spreading on the surface as well as invading the anal structure. (Dr. McKenney in 1916 reported such a case before this society which he determined was a secondary process to pulmonary tuberculosis.)

Another form rather rare is the so-called hyperplastic expression characterized by a diverse hypertrophy instead of caseation and necrosis. Stenosis is formed by the active proliferating cells including both mucosa and submucosal structures.

The same symptoms of diarrhea, tenesmus, sacral pain and loss of weight are present as in the ulcerative type of lesion. The patient usually succumbs to the general process before apparent obstruction is in evidence.

Case II. G. Y. is a male aged thirty-seven. A draftsman, married, with negative family history, developed one year before he came under observation a painful swelling at the anterior margin of the anus, which ruptured, discharging a creamy liquid. Some weeks later he presented himself for treatment, and was found to have a minute opening in the perineal skin, midline in front of the anus, which opened between the sphincters in the anal canal. The tissues were sensitive to probing, the subjacent skin was pinkish and not undermined. There was no history of cough, fever, hemoptysis, night sweats or any of the physical signs of lung involvement. The case was regarded as a simple non-specific anal fistula and was so treated. The patient was relieved of pain for a time but returned to me in about ten months when his wound was larger, looked rough, spongy and ulcerated with thickened edges and infiltrated. Tuberculosis was reported by the laboratory on examination of excised tissue. In the meantime, he developed dyspnea and signs of pulmonary tuberculosis. The prognosis of these cases is very unfavorable and the best treatment is to give attention to local conditions supplemented by approved modern treatment of general tuberculosis, consisting of fresh air and out-door life.

The writer advocates opening of sinuses as in ordinary infections but using the cautery to destroy the pyogenic structures. We believe this in no way affects adversely the prognosis of the tubercular process elsewhere as is commonly thought.

DISCUSSION

Dr. D. C. McKenney, Buffalo, N. Y.: My first paper before this Society was a case report of tuberculosis cutis ani. Since that time I have had a most interesting case of a prominent man who has been seen by many of the members of this Society, and which was very similar in many respects to the first case reported, excepting that this case by *x*-ray examination showed an old quiescent lung infection. After the second case came under my care I hunted up the specimen taken from the former case and with the pathologist studied it further. We learned something I did not fully appreciate before and that was that the infection was very superficial and did not extend into the deeper tissues. This fact helped to prove the rationale of the cauterization of tubercular lesions as advocated by Kiger and others. This second case started with large prolapsing internal hemorrhoids and a fissure posteriorly with considerable extension of the infection beneath the lining. The patient did not appear tubercular and physical examination of the lung did not show any evidence of it. I removed the hemorrhoids and excised the edges of the fissure. Healing was perfect except in the median line posteriorly and this part did not heal. Later I did two minor operations, removing the edges and cauterizing unhealthy tissues, but nothing stopped the extension upwards and around the anal canal, however the mucous membrane of the rectum has remained uninvolved and it is now over two years since I first saw this patient. At times certain areas would apparently heal but the infection of the epithelium has been progressive. Lately radium has been used and has helped to some extent to clear up the infection, I believe. Ten per cent iodoform in oil seems also to have had some beneficial effect but actual progress has been very, very slow. The patient has received heliotherapy but I have my doubts whether it did any good.

Some English investigators have found that sunlight through window glass does little if any good whereas direct sunlight does. The heliotherapy in this case was through window glass, and, as all window glass (I believe) has a certain amount of lead in it, the lead may have acted as a screen interfering with penetration of the rays. This man is improving slowly, his lung condition is not active, and I have hopes of his final recovery with perhaps considerable impairment of function.

Dr. Ralph W. Jackson, Fall River, Mass.: I have been one of the unhappy ones to have charge of this patient for a while, for Dr. McKenney asked me to look out for him while he was summering in Boston last year. I could do no more for him than Dr. McKenney, and probably not as much. Since then I have acquired a case of my own of even worse character, for, in addition to the anal tuberculous ulceration, this case also has a definite focus in the lungs, as shown by *x*-ray and physical examination, and a large mass in the left broad ligament, which presumably is of the same character. The anus is so extensively involved that the sphincters are practically gone, and there is no control with the possible exception of what little may be gotten from voluntary contraction of the levatores. I have tried everything without avail, and have now thrown up my hands and do not know what to do. In view of Dr. Kiger's work with the Percy cautery, perhaps he is the man to suggest something for such cases. Personally I think it would be a kindness for someone to suggest some form of euthanasia.

Dr. C. P. Gregg, St. Louis, Mo.: In regard to tuberculosis of rectum, I have had a case of a girl who worked every day. She had pain in the rectum, colitis and a diarrhea. A few tubercles could be seen by means of the proctoscope. She could not go to the hospital and could not quit her work, as a widowed mother depended upon her for support.

I was told of a preparation of copper discovered by a Japanese which was given intravenously in tuberculosis. His company very kindly furnished me with this solution in ampules, one ampule to be a dose. I admit I could not conscientiously carry out their instructions, so divided each ampule into six doses.

She was thirty-eight years old, and then weighed 120 pounds, and gave a history of having worked hard all of her life. She now weighs 145 pounds, and while she complains of some pain in the coccyx, she has no diarrhea. She eats well, and sleeps well, and is still holding her job.

What the final outcome will be, I do not know, but up to this time there is improvement.

Dr. William H. Kiger, Los Angeles, Calif.: I see a great many cases of tubercular infection around the rectum. In the charitable institutions of Southern California there are many tubercular cases, and many of these have a secondary infection around the rectum. I do not believe we have many primary tubercular infections in this region. These tubercular cases have a characteristic appearance. They burrow just under the skin and away from the canal more often than into the canal. There are often quite large areas involved and usually only one opening which has a peculiar punched out appearance.

Another characteristic feature is the lack of pain. These patients very seldom complain. I think the absence of pain in a fistula case should put us on our guard. The discharge of pus is thin and watery. I demonstrated to you the treatment I employ in these cases yesterday. I never touch these with anything but the cautery for these reasons: (1) It kills the infection. (2) It seals up the lymphatics. (3) There is no pain, no loss of blood, no shock. There is something about heat that stimulates the condition and they heal nicely. The way the rectal condition progresses is a good barometer for the condition of the lungs. I do not think Dr. Jackson can do much for his case because of the general condition. If she is having considerable pain cauterization may relieve that, at least you cannot do any harm and may do a great deal of good.

Dr. Pennington: In case you use the cautery and do not destroy all foci around, how about a secondary infection if it lights up? Does it spread more rapidly?

Dr. Kiger: I do not think so. You can use the cautery as often as you want to. Be sure to trim off the overhanging edges rather than leave any place where infection can take place.

Dr. Pennington: In other words, tuberculosis works in shady places?

Dr. Kiger: Yes. There is another thing I want to warn you about. You may have a patient who is not seemingly in a very bad condition. He looks very good. The lung involvement is not extensive, and if such a patient comes in with hemorrhoids, be mighty careful how you take these hemorrhoids off, because in place of having hemorrhoids you have three places unhealed which are as painful as three fissures in one patient.

Dr. Beach (closing): I am very glad to get this discussion by Dr. Kiger because not every Fellow is familiar with the kind of work he was doing here. The keynote of

the paper I did not read, but a remark made by Dr. Kiger covered it. These are secondary conditions as far as I have been able to determine, and these patients ultimately die from general tuberculosis.

In reference to Dr. Jackson's case, it is very much like the one I described in which I did a colostomy and put the rectum at rest. We need to do that.

Dr. Jackson: That has been refused in this case.

THE TOPOGRAPHY OF RECTAL AND ANAL DISEASES

J. Rawson Pennington, M.D.

CHICAGO, ILL.

Early in my career as a proctologist I discovered there was a definite line of demarcation between the location of certain anal and rectal ailments. I also observed, for example, that pruritus ani never occurred on the proximal side of the pectinate line; that proctitis never extended distally beyond this line; that diseases peculiar to the mucous membrane were always found on the proximal side of the line, while those peculiar to the squamous epithelium never extended proximally beyond this line.

These and other observations led me to make a more careful study of some well-known yet generally overlooked embryologic, anatomic and physiologic facts. These studies soon showed me that in the development of the continuity of the rectum and anus, from the hind-gut and proctodeum, respectively, the hind-gut in passing back to reach the surface pushes itself through the endopelvic fascia, carrying down on its walls a tube-like prolongation of this fascia, which may be looked on, not technically but practically, as a sheath about the rectum. When seen in section this tube-like projection very much resembles a basin with a hole in the bottom, which to all intents and purposes is a funnel, and as it is formed by the coalescence of the splanchnopleure and somatopleure I christened it the "Splanchnosomatic Funnel." This funnel was the nucleus about which the material for my forthcoming book was gathered.

For many years in my teaching and writings, I took occasion to dwell on the importance of the pectinate line as an anatomic, etiologic and diagnostic landmark. Finally, I had a large colored chart made illustrating my views and displayed it in the Hall of Scientific Exhibits at the 1921 meeting of the American Medical Association, and it was also shown at the 1923 meeting by request. This chart called forth many commendations from eminent surgeons, proctologists and other members of the profession and is reproduced herewith as the frontispiece.

You will observe the diseases are surrounded by labels and leaders which point to the figure or line indicating the location of the ailment in question. When the disease is located within certain limits it is represented by a figure in, or a short line through that region. If the disease occurs anywhere along the course of the pelvic colon, rectum, or anus a line indicating this is drawn through the entire region.

In explaining this chart I shall begin with fistula, as it is the first disease indicated at the left and on the inside of the bowel, and read the labels toward the right. A fistula, by the way, is an artificial communication between a normal cavity and the skin or mucous membrane.

Fistulae should be classed according to the anatomic position of the internal opening: A fistula with this opening in the pectinate line should be classified as an anorectal fistula because it partakes of both the anal and rectal structures. One with the internal opening in the anus should be known as an anal fistula or fistula-in-ano, and when the opening is in the rectum proper a rectal fistula. The external appearance of all fistulae is about the same. The severity of the disease, however, cannot be measured by the external appearance. The gravity of a fistula, all things being equal, depends upon the anatomic position of the internal opening and has much to do with the treatment. In the anal variety, the incision operation is the method of choice. In anorectal fistula, incision, or preferably, excision with immediate suture is to be preferred. In the rectal variety, restriction (seton) or constriction (ligature) should be the method employed.

This brief discussion with reference to fistula is to show how this chart simplifies and facilitates the study of rectal diseases with the ultimate object of improving the diagnosis and treatment. To attempt making a similar reference in this paper to all of the ailments on the chart is omitted because of the lack of space.

Next in this series is papillitis. It illustrates an inflamed papilla and is situated on the border of the pectinate line. Cryptitis or inflammation of a crypt, extends on the lesion from the border of the pectinate line into the anal region. This ailment frequently gives rise to perverted functions, reflexes, "focal infections," constipation, etc. Pruritus ani involves the skin of the anal region and that external to it, but not the proximal mucous membrane. Rectal polyp is situated in the ampulla. In fissure the ulceration extends from the border of the pectinate line in a distal direction. Fissure is generally single; if multiple are usually specific. Any portion of the circumference of the anus may be involved, though the most frequent location is the posterior commissure, next, the anterior, rarely the lateral. Condylomata involves the skin of the anus. Tenesmus extends into and proximal to the pectinate line. Con-

genital stricture is due to imperfect development of the anorectal strait, or incomplete absorption of the anal plate. Eczema is found in the anus or in the skin distal to it, but never in the mucosa. Ulceration may occur at any point in the course of the anus or even in the intestinal tract. (Note that the line so indicates.) Chancre is usually found in the anal region on the skin surface. Epithelioma is a form of cancer that occurs only on the distal side of the pectinate line. Neuralgia is a border-line symptom and manifests itself in, above or below the pectinate line, or extends beyond the anus. In rectal prolapse the break occurs on the proximal side of the pectinate line. In the imperforate rectum the anus is duly formed, the continuity of the bowel proximal has not been established. Imperforate anus is a type of malformation in which the rectum which has been developed down to the pectinate line, but the canalization distal to this has not taken place. In perineal sinus you will observe that the opening of a sinus and that of a fistula are identical. However, a fistula, as stated above, is an *artificial* communication between a *normal* cavity and the skin or mucous membrane, while a sinus is an *artificial* communication between an *artificial* cavity and the skin. A sinus, then, with the opening in the perineal region should be classed as perineal. Anal sinus is so called because the orifice is in the anus; anorectal sinus, because the opening is in the pectinate line, i. e., the junction between the anus and rectum. Rectal sinus is the opening located in the rectum proper. An interno-external hemorrhoid, is so called because a part of the mass is above and a part below the pectinate line. This is a border-line disease. An internal hemorrhoid is located on the proximal side of the pectinate line and covered by mucosa. It might be classified with the visceral diseases. External hemorrhoid is located in the anus distal to the pectinate line and covered with skin. This, again, might be termed a perineal disease. Perirectal tumors, cysts, etc., may be found anywhere in the perirectal tissues. Subcutaneous abscess derives its name from being located just below the perianal skin.

Returning now to the left side (but on the outside of the bowel). Above we see the abscess in the superior pelvi-rectal space. Below, an ischiorectal abscess, the purulent collection situated in the fossa of the same name, and a submucous abscess, as the name implies, immediately under the mucous lining. Finally, at the top of the picture we find in order from left to right, acquired stricture. This type may occur at any point in the course of the intestinal canal. Proctocolitis never extends distally beyond the pectinate line nor does it involve the squamous epithelium. As tuberculosis is no respecter of tissue, it may be found either in the squamous or columnar epithelium. Venereal disease may be located anywhere from the pectinate line proximally. (Chancre,

in this instance, is indicated on the distal side as it is more frequently found here.) Benign tumors are new growths which may involve any portion of the gastrointestinal tract. While carcinoma occurs anywhere along the intestinal tract (unlike epithelioma) it is most common just above the anus, or at the junction of the rectum and pelvic colon. Intussusception or prolapse of the pelvic colon into the rectum is the break taking place usually at or near the rectosigmoidal junction. Fibrosis is of a rectal valve.

It cannot be gainsaid that the foregoing observations pave the way for a simpler, better and more comprehensive proctology. They also show the feasibility of blocking, regional, or infiltration anesthesia in many rectal operations. It is now eighteen years and more since I demonstrated the feasibility of blocking this region with local anesthetics.[1]

DISCUSSION

Dr. Louis A. Buie, Rochester, Minn.: One of the chief reasons for the lack of knowledge concerning proctology is that the university courses are inadequate, both during undergraduate and graduate years, and there are very few institutions which offer post-graduate work. I feel that one of the greatest problems is the instruction of the general practitioner and graduate student in rectal diagnosis. I have found that those who visit clinics are always quite enthusiastic. However it has been very difficult to demonstrate to them the lesions which are found in the rectum and the sigmoid. This difficulty has been due to the fact that two of us could not see the object at the same time. It has been necessary to locate the object and then to move away in order to permit the assistant or the visitor to look at it, while discussion is being given from memory. Often a cough or a deep breath is sufficient to move the field completely out of view. And so it has been very unsatisfactory. A number of months ago, I therefore took up the matter of devising an instrument with which both the assistant and the examiner might view objects through the proctoscope at the same time, and Mr. Maijgren of the Electro-Surgical Instrument Company of Rochester, New York, finally made the attachment for me. Almost all proctoscopes have an appliance used for inflating the bowel. This double-window attachment is to be fitted into the inflating apparatus. It consists of a system of reflecting mirrors, and I have found it most useful for teaching.

Dr. Yeomans, New York, N. Y.: In 1916 I procured in London an attachment for the proctoscope constructed on lines identical with the instrument shown by Dr. Buie. It was made by Loewenstein of Berlin. By means of an adapter it fits a tube of any caliber. Of course the lens must be of the proper focal distance. It is the same idea, and it shows how two people working along similar lines will arrive at the same conclusion. I have used the instrument with satisfaction for several years to demonstrate rectal pathology to students.

Dr. William M. Beach, Pittsburgh, Pa. I can see so much of value in this paper that I think we ought to pass a motion that this particular chart be published and be handed out to the members of the Society.

[1] *Transactions Chicago Medical Society*, April 12, 1905.

Dr. Frank C. Yeomans, New York, N. Y.: I wish to compliment Dr. Pennington on his beautiful chart because it serves admirably to popularize proctology in the profession. The great difficulty has been and still is a lack of teaching of proctology to undergraduates, and this sort of thing will promote that teaching and simplify it and make it understandable.

The doctor is to be congratulated on presenting in such a chart the general pathology of the parts.

Dr. Charles E. Howard, Cincinnati, O.: If I remember rightly, last year there was something said about appointing a committee in regard to rectal nomenclature, and when Dr. Pennington was showing this beautiful chart, I thought it an excellent one for clearing up the misunderstanding there may have been about terms.

Dr. Pennington (closing): I am very grateful to you for expressing a wish that the Society publish this chart (Topography of Proctologic Diseases) in colors so that it may be used as a wall chart for a doctor's office. A reproduction of it in black and white will be used as the frontispiece of my book.[2]

CARCINOMA OF THE RECTUM, RECTOSIGMOID AND SIGMOID*

Louis A. Buie, M.D.

ROCHESTER, MINN.

A statistical study of the results in cases of carcinoma of the pelvic colon observed at the Mayo Clinic has been made from a review of the histories of 1,937 patients who came to the Clinic between January 1, 1910 and December 31, 1922.

Age and Sex. Eighty-six and seven-tenths per cent of the patients were over forty years of age (Fig. 1). Sixty-eight per cent of the patients were males, and 32 per cent were females. It is interesting to speculate as to the cause of this distribution.

Symptoms and Diagnosis. From a study of 355 cases in which the patient's complaint was definitely recorded, it was found that the chief complaints were bleeding (40 per cent); pain (39.4 per cent); increasing constipation (31.83 per cent); diarrhea (20.84 per cent); and obstruction (7.32 per cent). These figures will not total 100 per cent because frequently several symptoms were combined in the patient's complaint, and each symptom was recorded. Associated complaints, such as deformed stools, pruritus, poor control, and so forth (Chart 2) were not referred to by the patient as the chief disorder, and were ascertained only after questioning the patient in the routine taking of the history.

[2] Pennington, J. Rawson, Treatise on Diseases and Injuries of the Rectum, Anus and Pelvic Colon, Philadelphia, 1923.

* This is a preliminary report of a more elaborate study of malignancy of the colon.

Twelve per cent of the patients had no loss of weight; 75.52 per cent lost over ten pounds, and 50 per cent lost over twenty pounds (Table 2). The duration of the symptoms was usually less than two years; in only 6.7 per cent of the cases had the symptoms been present more than three years. In 82.7 per cent the duration was less than two years, in 49 per cent, less than one year, and in 21.1 per cent, less than six months.

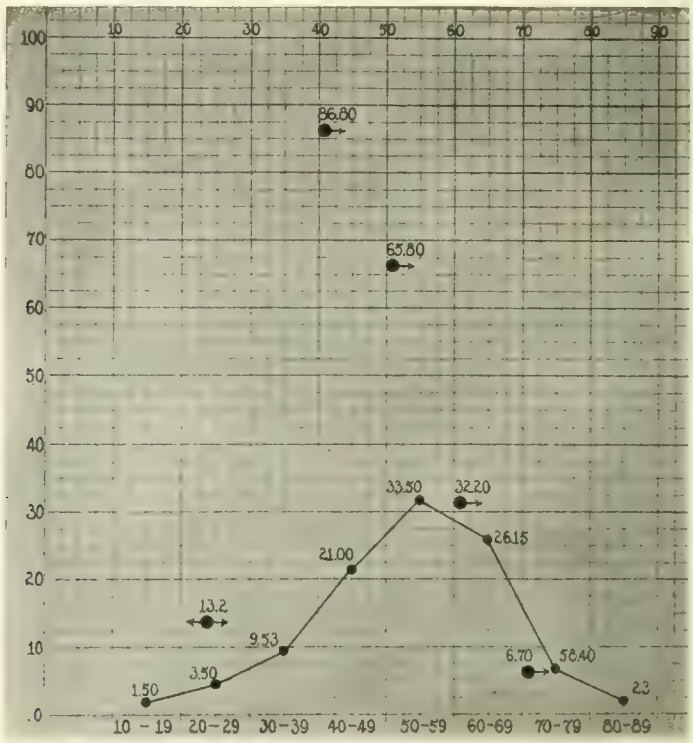

FIG. 1. Age incidence in 1300 cases.

The duration of symptoms is one of the chief points in differential diagnosis between benign strictures and malignancy. In the former group among those who come to the Clinic few patients give histories of less than two years' duration, whereas in the latter the disease rarely permits the patient to live longer than two years unless surgical or other treatment is given.

A study of the relative location of pain brings out the fact that, in low-lying lesions, pain in the rectum is most common, and abdominal pain less often troublesome. In high lesions, the reverse is true (Fig. 2). Pain in the back and sacrum was greatest in patients with low-lying lesions,

and decreased with the height of the lesion, whereas abdominal pain increased with the height of the lesion.

Of 1,150 records with hemoglobin reports, there were two in which the hemoglobin was less than 20 per cent; in thirteen it was between 20 and 29 per cent; in nineteen, between 30 and 39 per cent and in thirty-nine, between 40 and 49 per cent. In 93.3 per cent, the hemoglobin was over 50 per cent, and in 63.4 per cent it was within normal limits.

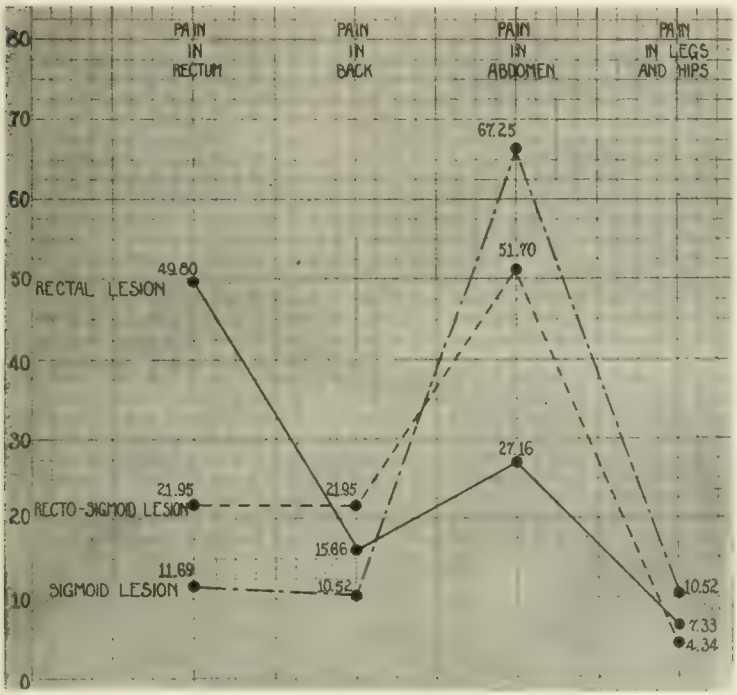

FIG. 2. Location of pain.

Roentgenologic and Proctoscopic Examinations. Of the 278 cases in which operation was not performed at the Clinic, roentgenograms of the chest were taken in 110. Nine of these, or 8.18 per cent showed metastatis to the lung. Of 320 roentgenograms of the colon, 222 were positive. Roentgenograms of the rectum were positive in 46.34 per cent; of the rectosigmoid in 72 per cent, and of the sigmoid in 90.98 per cent. One patient had metastasis in the skull, but in the relatively few of the roentgenograms that were taken of the spine and pelvis, there were no positive reports of metastasis.

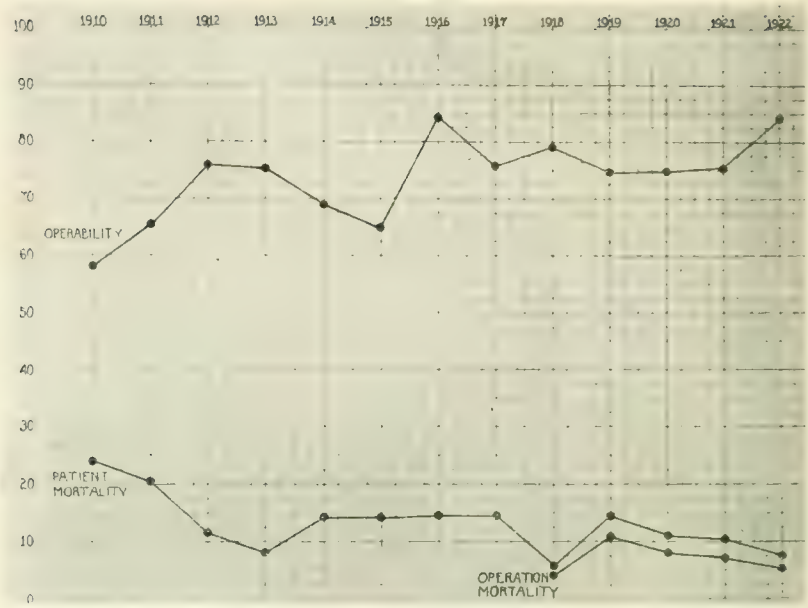

FIG. 3. Operability and mortality.

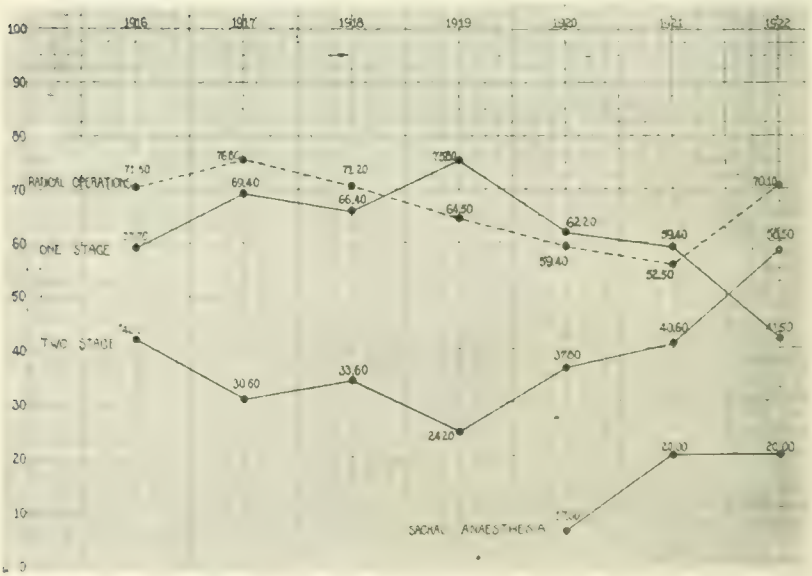

FIG. 4. One and two-stage operations in 1022 cases.

One hundred, seventy-three proctoscopic examinations were made in the 278 cases. The lesion was located in 171 cases. The other two were reported "negative 24 cm.," and in both of these cases the colon *x*-ray revealed "filling defects in the sigmoid."

It is noteworthy that only 26 per cent of the patients with essential rectal disorder had been examined proctoscopically before coming to the Clinic, and 18 per cent had been operated on, or received treatment for hemorrhoids during the period of their presenting symptoms.

Mortality Following Operative Treatment. One thousand, four hundred fifty-seven operations were performed on 1,022 patients between January 1, 1916 and December 31, 1922. The operability and mortality percentages are based on the number of patients operated upon, and

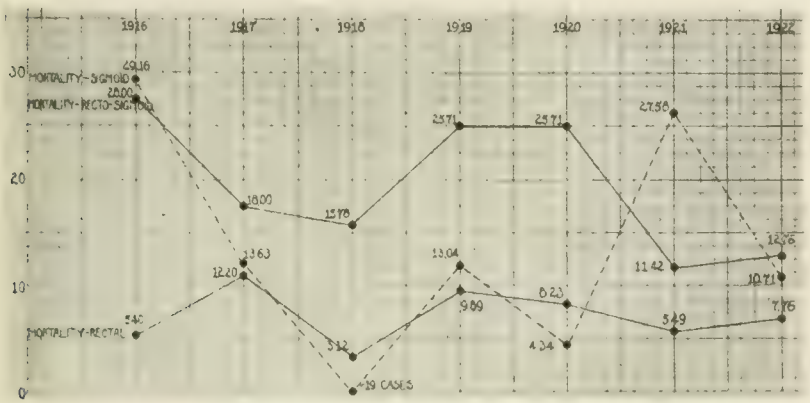

FIG. 5. Comparative mortality in operations on the rectum, rectosigmoid and sigmoid.

not on the number of operations done, and any death which occurred in the hospital following operation for carcinoma of the pelvic colon, was charged as an operative mortality even if complications arose in the lung, kidney, or other organs, and caused the patient's death.

Moreover, in a review of this particular subject, the ratio between radical and palliative operations has a distinct bearing, and has therefore been worked out accurately. We would expect that with an increase in operability, there would be a corresponding increase in mortality; i. e., if we select carefully for operation twenty-five out of every hundred cases that come in, we will make a much better showing, than if we attempt to operate on seventy-five out of every hundred. This has not proved to be the case in the series reported here, as is quite clearly shown by the curve (Fig. 3). In spite of the decided extension of operability, the mortality has gradually decreased. It is quite probable that the improvement in surgical methods and technique is to a great degree

responsible for this gratifying result, also the improved pre-operative preparation. The increasing use of two-stage operations is doubtless a contributing factor, and the ratio between palliative and radical operations also has a decided effect on the mortality curve. Moreover, the

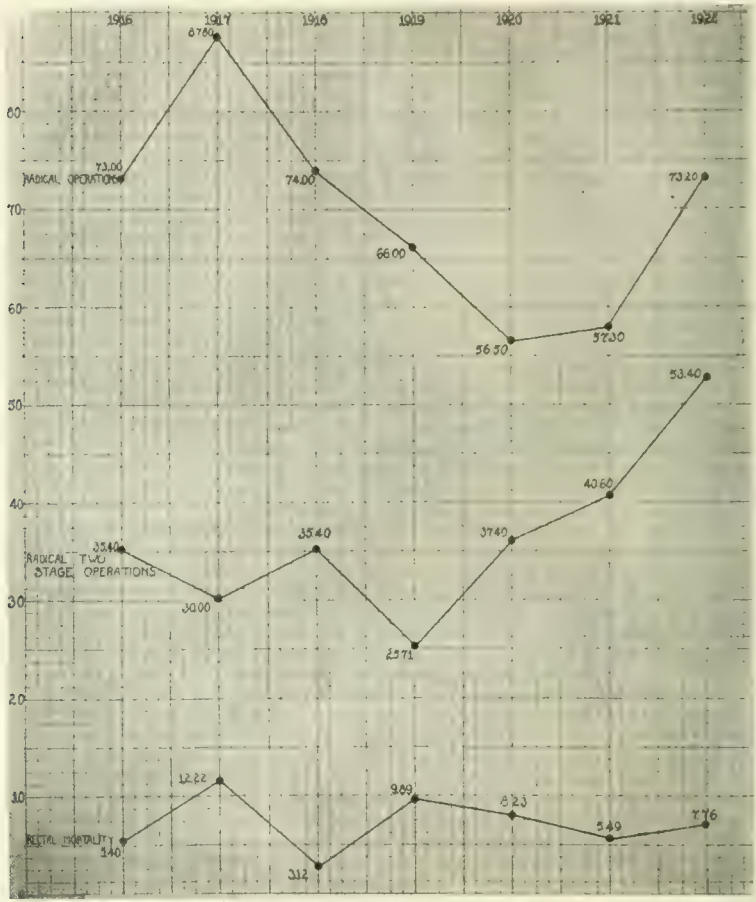

FIG. 6. The effect of radical and two-stage operations for carcinoma of the rectum on the mortality curve.

use of sacral anesthesia has materially reduced the risk of operation (Fig. 4). Of the 1,022 patients operated on, 693 or 67.8 per cent underwent radical operations. Figure 4 illustrates the relative variation between two-stage and one-stage operations, and it seems that we should heed the evidence furnished by the rise in the two-stage curve. The mortality has been highest for carcinoma of the rectosigmoid (Fig. 5), it being 18.3

per cent; for carcinoma of the sigmoid, it was 14.5 per cent; and of the rectum, 7.44 per cent. It will be noted in Figure 6 that each year the curve of mortality goes in the opposite direction to the curve representing the number of two-stage operations, and that, if more two-stage operations are performed, the mortality is lowered; moreover, in 1921–1922 the mortality rate remained low in spite of the fact that the number of radical operations increased, because there was a decided increase in the number of two-stage operations for carcinoma of the rectum.

The different types of operation performed in the cases reported here are shown in Table 3.

Inoperable Cases. A closer study was made of the 278 cases in which operation was not performed to ascertain why they did not come to operation. It was found that 43 per cent of the patients were advised to have an operation, but for various reasons did not. Thirty-one per cent of the remainder had palpable glands in the groin, axilla, neck or pelvis; 2 per cent had glands in the abdominal wall; 8.18 per cent of the 110 cases in which roentgenograms of the chest were made had metastasis to the lungs; one patient had metastasis to the skull, and 14.8 per cent had palpable nodules in the liver. Six per cent of the patients were over seventy years of age, and three patients over eighty years. During the twelve months previous to registration at the Clinic, 29 per cent had undergone colostomy, and had been pronounced inoperable or had had a Kraske operation, or resection, with recurrence; or had been treated with radium and roentgen rays. Almost half the number of patients (41.2 per cent) had lesions that were fixed.

Conclusions. My deductions may be summarized as follows:

1. Sixty-eight per cent of the cases of carcinoma of the pelvic colon were in males, and 32 per cent in females.

2. Eighty-six and seven-tenths per cent of the patients were over forty years of age.

3. The symptoms in the order of incidence were bleeding, pain, constipation, diarrhea, and urinary discomfort.

4. Deformed stools occurred in only 14.4 per cent, and yet 35.44 per cent of the lesions were limited to the first 7 cm. of the rectum, 88 per cent were limited to the first 15 cm., and only 12 per cent were in the sigmoid.

5. The duration of symptoms was usually less than two years (82.7 per cent).

6. If the lesion was low, the pain was usually most marked in the rectum, and least noticeable in the abdomen. If the lesion was high, the pain was more marked in the abdomen than in the rectum.

7. Hemoglobin is normal more often than not.

TABLE 1

CHIEF COMPLAINT

	Cases	Per cent
Stated in	355	
Bleeding	142	40 0
Pain	140	39.4
Increasing constipation	113	31 83
Diarrhea	74	20.84
Obstruction	26	7 32
ASSOCIATED SYMPTOMS*		
Bleeding	608	84.0
Constipation	608	59 3
Pain	132	67.4
Diarrhea	608	26.6
Urinary symptoms	476	25 4
Deformed stools	132	14.4
Pruritus	132	3 8
Poor control	476	1 48

* Based on three groups of cases.

TABLE 2

DURATION OF SYMPTOMS

	Per cent
Less than 6 months	21.1
Less than 1 year	49 0
Less than 2 years	82.7
More than 3 years	6.7
LOSS OF WEIGHT	
No weight lost	12 0
More than 10 pounds	75.5
More than 20 pounds	50.0
More than 30 pounds	22.0

TABLE 3

TYPES OF OPERATION PERFORMED

	Rectum	Recto-sigmoid	Sigmoid	Total cases	Per cent
Three-stage Mikulicz		13	43	56	11.5
Two-stage Mikulicz		5	13	18	2.4
One-stage Mikulicz		2	4	6	0.4
Resection (end-to-end anastomosis)	4	16	24	44	3.0
Tube resection		26	16	42	2.8
Resection and colostomy		2	6	8	0.5
Combined colostomy and posterior excision	1			1	0.06
Two-stage resection	222	79	6	307	42.0
Combined posterior and anterior resection and permanent colostomy			1	1	0.06
One-stage posterior resection		14		14	0.96
One-stage Kraske resection			1	1	0.06
One-stage combined perineal and abdominal resection and colostomy	9	6		15	1.03
Enteroanastomosis			3	3	0.25
Quénu-Tuttle	11	1		12	0.8
Cautery	4			4	0.27
One-stage posterior excision	133			133	9.1
Abdominal excision		1		1	0.06
Excision of growth	3			3	0.25
Excision and cautery	2			2	0.13
Incision, dilatation and colostomy	1			1	0.06
Harrison-Cripps	12			12	0.82
Miscellaneous (enterostomy, cecostomy, ileostomy, ileosigmoidostomy)	2	6	5	13	0.89
Colostomy	162	69	29	260	10.9
Exploration	21	25	17	63	4.3
Total patients operated on	587	265	168	1020	

Total operations performed 1,457

8. Too many patients with cancers of the pelvic colon are operated on for hemorrhoids without a previous examination, and at the time of the operation carcinomas are found for the first time.

9. Some cancers of the lower bowel metastasize to the lung and it is therefore necessary to examine the lungs routinely with the roentgen ray.

10. The three outstanding reasons for the reduction in operative mortality are: (a) improved surgical technique; (b) increased number of two-stage operations; (c) sacral anesthesia.

11. Surgeons are becoming more radical in their attempts to help more patients, and this is evidenced by the increase in the operability in twelve years from 56 to 84 per cent.

DISCUSSION

Dr. Frank C. Yeomans, New York, N. Y.: This is a very valuable paper because it presents a summary of statistics on a subject that is very important, i. e., cancer of the different segments of the distal bowel. It is only by collecting a large amount of statistics that it is possible to arrive at conclusions as to the best method of treatment, and what will in the long run give us the best results. Therefore, I think we are greatly indebted to Dr. Buie for having collected these statistics and for presenting them to us. They represent the work of the clinic at Rochester and not the work of any one man.

Dr. J. Rawson Pennington, Chicago, Ill.: As W. J. Mayo stated a few years ago, "quantitative work in these days gives us real help." Dr. Buie's paper is of that type. It is such papers as this that will enable us to arrive at conclusions that will be valuable in the study of cancer.

Dr. Buie (closing): I have nothing further to add except to say that I intend to continue the study of carcinoma in the various segments of the colon and bring it up-to-date as suggested by Dr. Pennington.

Some one asked me this morning if I had said that 80 per cent of all cases showed metastases of the lung. That is not the correct figure. The statistics I presented were taken from 248 cases out of 1,300 which came to the Clinic between 1916 and 1923, and were not operated upon. Of the 248 cases not operated on, 43 per cent were in patients that did not care to have an operation done at the time, and they refused operation. Thirty-one per cent of these cases had enlarged glands in the axilla, the groin or the neck; 2 per cent had enlarged glands in the abdominal wall; 29 per cent had had previous colostomies, Kraske operations, or other resections with recurrence after previous *x*-ray or radium treatment. In 41 per cent the lesions were fixed, and only 8.2 per cent of the patients who were not operated on had lung metastases as shown by the *x*-ray.

One of the little points which I would like to mention which I think is extremely significant, and which has been indicative of improper and incomplete handling of patients when they present rectal symptoms, is the fact that 18 per cent of those operated on for carcinoma had had previous operations or treatment for hemorrhoids during the year previous to their admission to the Clinic. That is quite a significant thing, and indicates that there is something wrong in the handling of patients when they present rectal symptoms.

AN ORIGINAL TREATMENT FOR RECTAL STRICTURE

E. Jay Clemons, M.D.

LOS ANGELES, CALIF.

This discourse deals with that variety of acquired rectal stricture caused by some pathological process, which constricts the caliber of this portion of the large bowel.

As a number of exciting causes may be responsible for such a condition, it is absolutely necessary for one to determine upon the etiology, before starting to treat a patient.

The subject of preliminary treatment will not be dealt with, only in so far as to state that all active processes should be made quiescent, before instituting the procedure suggested below.

In other words, all ulcerations should be healed. This having been done, we are to deal with a narrowing of the gut, due to the formation of scar tissue.

The solution of the problem is found in the use of a means which changes the offending structure, from a hard resisting, to a soft yielding state.

Edema will produce this desired result, as it causes each cell of the fibrosed area to become distended and subsequently to liberate a serous exudate after which the parts remain soft and boggy.

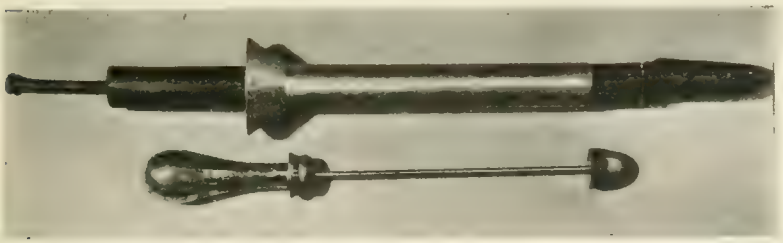

Fig. 1. This proctoscope has its obturator replaced by a piece of rubber hose. From this hose projects a finger-cot filled with carbon dioxide snow. Through the hose has been passed a retaining catheter which is attached to the finger-cot.

Your attention is drawn to the fact that this can be accomplished by using carbon dioxide snow for the purpose of abstracting latent heat from the body.

The temperature of this substance is 109°F. below freezing. It is made by liberating the compressed gas into a chamois sack.

Sloughing would result if the snow were to be placed directly in contact with the body and a proctitis would occur if the escaping gas came in contact with rectal mucosa. In order to avoid this the snow is put within a finger-cot, the upper end of which is attached to a retaining catheter, thus preventing direct contact and at the same time supplying a means for the gas to escape.

When the catheter is inserted into the lumen of a piece of rubber hose whose diameter is that of an obturator of a proctoscope, not only has a way been found for applying the agent to any portion of a rectum, but there is also a means for making pressure with the encased snow against the strictured area.

Experience, while making over three hundred applications, has proved that if cots be inserted at fifteen minute intervals for one hour, the desired result is obtained without any untoward effects.

About thirty-six hours after the treatment a serous exudate makes its appearance. This gradually diminishes, till it abates within four days.

One week later another similar series of applications is made, at which time the stricture is previously dilated, so that the cots can be placed within the lumen of the strictured gut.

The after-care is only a matter of having a patient report from time to time in order to keep the case under observation.

This form of treatment is presented to you as a means for fulfilling The Golden Rule of the practice of The Healing Art, namely to relieve in a pleasant, safe and quick manner.

The procedure is not incapacitating. It is painless. There are no untoward effects and a stricture does not tend to recur. In fact it becomes more and more pliable as time goes on, owing to the dilatation produced by the passing bowel contents.

DISCUSSION

Dr. Louis A. Buie, Rochester, Minn.: It has been my experience that in treating strictures of the benign type it is necessary to eradicate the ulceration. I gathered the impression from the remarks of the author of this paper that none of these strictures can be treated with carbon dioxide snow until the ulceration has been eradicated.

Dr. Charles E. Howard, Cincinnati, O.: We saw a case this morning of rectal stricture. Am I to understand that this treatment is just as suitable in cases of anal stricture?

Dr. D. C. McKenney, Buffalo, N. Y.: I would like to ask the essayist how he gets rid of infection associated with stricture, because my experience has been that the ulceration is usually found above the stricture.

Dr. J. Rawson Pennington, Chicago, Ill.: I examined two or three of Dr. Howard's cases that had been treated with the "snow." In each there was cicatricial tissue in the rectum, but it seemed to be softer than such tissue usually is.

Dr. William M. Beach, Pittsburgh, Pa.: I think this is the best thing we have had at this meeting. I never attend a meeting of this Society without some one throwing on a great light, and the light at this meeting is Dr. Clemons' paper, and I think that we should all try out this method for the only method of treatment I have ever pursued is one that I reported at the Chicago meeting in 1908, namely, to do a colostomy and let the stricture alone. I was speaking then of luetic strictures mostly. I will try the carbon dioxide snow.

Dr. William H. Kiger, Los Angeles, Calif.: This is Dr. Clemons' idea, and when he suggested it to me over a year ago I was enthusiastic and told him to go ahead and try it out. We have not operated on a stricture since, and your examination of these patients that had been treated gave a better idea than I could. So you have to take our word for the condition they were in before. It is the best treatment I have seen. How long it will last we do not know; we have not tried it out long enough. It is an original idea, and the best thing we have ever had for that condition for which our other treatment has been unsatisfactory. If it lasts for two or three years, one can do it again.

Dr. Pennington: This morning you said that cells of a strictured area are flat while those of edematous tissue are round. In comparison, I mentioned the fact that a pair of wet rubber gloves become shrunken and glued together provided they are thrown aside while if they are placed into a basin of water they will swell.

Dr. Gregg: While watching your work this morning, I got the impression that you have a wonderful way for making applications whereby everything is absolutely under control.

Dr. Clemons (closing): In answer to one of the questions asked, it can be said that carbon dioxide gas is inert, however, its temperature would cause a proctitis if it came in contact with rectal mucosa after being liberated from melting snow.

A person suffering from a specific ulceration of the rectum associated by stricture formation should be put upon active antisyphilitic medication till the ulceration is healed before resorting to the use of the snow.

Dr. Buie: There are types of rectal ulceration associated by stricture other than those which are syphilitic. Suppose we have a patient in whom there is such a condition, shall we go ahead and thus treat the case at the same time carrying out the indicated medication?

Dr. Clemons: Yes. The point I wish to make is that a stricture cannot be cured with carbon dioxide snow till its cause is eliminated.

In answer to Dr. Howard's question, I will say that we have not so treated a patient suffering from anal stricture but our chief (Dr. Kiger) performed an operation which effected a cure.

THE CLINICAL PROGRAM

A REPORT ON THE CLINICS HELD AND THE INSTRUMENTS DEMONSTRATED

JOSEPH F. MONTAGUE, M.D.

NEW YORK, N. Y.

On the mornings of June 22nd and 23rd the members of the Society were the guests of Dr. William H. Kiger at the Los Angeles County Hospital. The operative part of the program consisted in a large series of operations for fistula and for hemorrhoids. During the operations Dr. Kiger discussed with the members the gratifying results he has had with the use of the modified Percy cautery in cases of carcinoma of the rectum and later he demonstrated the cautery instruments he himself uses in this condition. He also recommended the use of cautery in fistula cases particularly in those of the tubercular type. Dr. J. Rawson Pennington was given the opportunity to demonstrate his "open" method of hemorrhoidectomy. In all of the operations performed during the clinics sacral anesthesia was used. The anesthesia was perfect in every respect and its successful routine use made quite an impression on those of us who have hitherto preferred the use of general or local anesthesia.

Dr. Jay Clemons gave a very convincing demonstration of the technique he uses in the carbon dioxide snow treatment of rectal strictures, the details of which are described in his article published in this volume. Several cases pronounced entirely relieved were shown and offered for examination by the members of the Society. All agreed that the stricture, which Dr. Kiger assured us had been almost complete, was thoroughly palliated if not entirely cured. Dr. Clemons assured us that the patients were having normal evacuations without any pain or discomfort. The method is very appealing.

During the intervals between Dr. Kiger's operations and Dr. Clemons' demonstrations various members of the Society exhibited instruments and refinements of technique which they had devised since our last meeting.

A most ingenious device was shown by Dr. McKenney. Its object is to provide an emergency knife of any desired shape. An ordinary razor blade is wrapped in a piece of stout paper and the blade broken by forcible bending. The paper is then opened and the various shaped fragments furnish any desired shaped blade, which, grasped by any ordinary hemostat, constitutes an excellent make-shift bistoury or scalpel.

Dr. Buie showed a binocular attachment for a sigmoidoscope which by a clever arrangement of mirrors allows two persons to view the field

being examined. It seems ideal for use with students. It is made by the Electro-Surgical Instrument Co., Rochester, N. Y.

Dr. Beach exhibited a bivalve self-retaining speculum the use of which he demonstrated on a case. A bulging of the distal end of the blade favors the retention of the instrument. It is made by R. A. Boldt, 422 Penn Ave., Pittsburgh, Pa.

A novel method of draping a patient in the knee chest position was shown by Dr. Zobel. A sheet is held with neighboring corners in either hand and then a loose knot is partially tied in the sheet, the knot being placed above the sacrum while the loop of the untied knot furnishes the desired exposure of the perianal region.

A new rectal fistula drain was shown and explained by Dr. Montague. It is essentially a cotton wool roll with a tape running through the center and comes in two, four and six inch sizes. Its advantages are that granulation tissue does not grow into it as in the case of gauze. It is very easy to place in position and not only takes up medications very well but also gives them up readily. It is made by Johnson and Johnson, New Brunswick, N. J.

A new type of sigmoidoscope was shown by Dr. Pennington. It consists of a simple examining tube with the exception of the proximal inch which is set at an angle of 22° with the tube itself. By means of this angle a separate light carrier may be introduced. In this way the caliber of the instrument is not increased nor is the light encumbered by the usual protecting glass at the distal end of the auxiliary tube. It is made by Grieshaber Mfg. Co., Chicago, Ill.

Dr. Buie drew attention to the advantages of his sigmoidoscope which he said was a modification of Dr. Beach's. His modifications consist in a flange on the rim of the distal end of the tube and a variation from the diameter as given by Dr. Beach. The diameters of Dr. Buie's instruments, of which there are three in a set, are from 1 to 2 cm.

A pair of rectal scissors equipped with a double edge was shown by Dr. Montague. They are especially designed for the undercutting operation commonly used in operations for pruritus ani. Their double-edged blades allow them to cut when open as well as when closed and thus renders them exceptionally efficient for work in this operation. There are two models, a flat and a curved-on-the-flat, and both are of utility in rectal surgery. They are made by George Tiemann and Co., 107 East 28th Street, New York, N. Y.

INDEX

Admonitions, suggestions and criticisms, some, Joseph M. Mathews, 5
Ambulant treatment of anorectal fistula, Arthur C. Crookall, 49
Amputation for marked first and second degree prolapse of the rectum, circular, Frank C. Yeomans, 10
Anal diseases, topography of rectal and, J. Rawson Pennington, 67
Anesthesia, anorectal operations under local, J. F. Saphir, 41
in proctologic surgery, sacral, A. J. Murrieta, 35
Anorectal fistula, ambulant treatment of, Arthur C. Crookall, 49
operations under local anesthesia, J. F. Saphir, 41
Anus and rectum, tuberculosis of, William M. Beach, 61
Authors:—
Beach, William B.—Tuberculosis of the anus and rectum, 61
Buie, Louis A.—A statistical review of carcinoma of the rectum, rectosigmoid and sigmoid, 71
Clemons, E. Jay—An original treatment for rectal stricture, 81
Crookall, Arthur C.—The ambulant treatment of anorectal fistula, 49
Howard, Charles E.—Polyps of rectum and large bowel, 57
Mathews, Joseph M.—Some admonitions, suggestions and criticisms, 5
Montague, Joseph F.—An original bacteriological research of pruritus of the perineum (pruritus ani, vulvae and scroti), 16
The clinical program, 84
Murrieta, Alfred J.—Sacral anesthesia in proctologic surgery, 35
Pennington, J. Rawson—The topography of rectal and anal diseases, 67
Saphir, Joseph F.—Anorectal operations under local anesthesia, 41
Terrell, Emmet H.—Presidential address, 1
Yeomans, Frank C.—Circular amputation for marked first and second degree prolapse of the rectum, 10
Bacteriological research of pruritus of the perineum (pruritus ani, vulvae and scroti), an original, Joseph F. Montague, 16
Beach, William M., Discussion, 15, 32, 48, 70, 83
Tuberculosis of the anus and rectum, 61
Bowel, polyps of the rectum and large, Charles E. Howard, 57
Buie, Louis A., Carcinoma of the rectum, rectosigmoid and sigmoid, 71
Discussion, 46, 70, 82, 83
Carcinoma of the rectum, rectosigmoid and sigmoid, a statistical review of, Louis A. Buie, 71
Circular amputation for marked first and second degree prolapse of the rectum, Frank C. Yeomans, 10
Clemons, E. Jay, An original treatment for rectal stricture, 81
Clinical program, the, Joseph F. Montague, 84
Criticisms, some admonitions, suggestions and, Joseph M. Mathews, 5
Crookall, Arthur C., Ambulant treatment of anorectal fistula, 49
Discussion, 32, 46

Data of the American Proctologic Society, vii
Discussions:
Beach, William M., 15, 32, 48, 66, 70, 83
Buie, Louis A., 46, 70, 80, 82
Clemons, E. Jay, 83
Crookall, Arthur C., 32, 46, 56
Earley, Arthur H., 33
Gregg, C. P., 61, 65, 83
Howard, Charles E., 47, 61, 71, 82
Jackson, Ralph W., 15, 33, 48, 59, 65
Kiger, William H., 16, 39, 45, 60, 66, 83
McKenney, Descum C., 15, 39, 56, 59, 65, 82
Minor, James C., 32
Montague, Joseph F., 34
Murrieta, Alfred J., 40
Newman, Samuel E., 47, 60
Pennington, J. Rawson, 15, 33, 45, 47, 56, 60, 66, 80, 83
Saphir, Joseph F., 31, 39, 48, 55
Yeomans, Frank C., 16, 40, 59, 70, 80
Zobel, Alfred J., 47, 56, 59
Diseases, topography of rectal and anal, J. Rawson Pennington, 67
Earley, Arthur H., Discussion, 33
Fellowship of the American Proctologic Society, active, ix
associate, x
honorary, ix
First and second degree prolapse of the rectum, circular amputation for, Frank C. Yeomans, 10
Fistula, ambulant treatment of anorectal, Arthur C. Crookall, 49
Gregg, C. P., Discussion, 61, 66, 83
Howard, Charles E., Discussion, 47, 71, 82
Polyps of the rectum and large bowel, 57
Jackson, Ralph W., Discussion, 15, 33, 48, 59, 65
Kiger, William H., Discussion, 16, 39, 45, 60, 66, 83
Local anesthesia, anorectal operations under, J. F. Saphir, 41
McKenney, Descum C., Discussion, 15, 39, 56, 59, 65, 82
Mathews, Joseph M., Some admonitions, suggestions and criticisms, 5
Minor, James C., Discussion, 32
Montague, Joseph F., Original bacteriological research of pruritus of the perineum (pruritus ani, vulvae and scroti), 16
The clinical program, 84
Murrieta, A. J., Discussion, 40
Sacral anesthesia in proctologic surgery, 35
Newman, Samuel E., Discussion, 47, 60
Officers of the American Proctologic Society, former, vii
Operations under local anesthesia, anorectal, J. F. Saphir, 41
Original bacteriological research of pruritus of the perineum (pruritus ani, vulvae and scroti), Joseph F. Montague, 16
Treatment for rectal stricture, an, E. Jay Clemons, 81
Pennington, J. Rawson, Discussion, 15, 33, 45, 56, 60, 66, 80, 83
Topography of rectal and anal diseases, 67

Perineum, an original bacteriological research of pruritus of (pruritus ani, vulvae and scroti), Joseph F. Montague, 16
Polyps of the rectum and large bowel, Charles E. Howard, 57
Presidential address, Emmet H. Terrell, 1
Program, the clinical, Joseph F. Montague, 84
Prolapse of the rectum, circular amputation for marked first and second degree, Frank C. Yeomans, 10
Pruritus of the perineum (pruritus ani, vulvae and scroti), an original bacteriological research of, 16
Rectal and anal diseases, topography of, J. Rawson Pennington, 67
stricture, an original treatment for, E. Jay Clemons, 81
Rectosigmoid and sigmoid, a statistical review of carcinoma of the rectum, Louis A. Buie, 71
Rectum and large bowel, polyps of the, Charles E. Howard, 57
circular amputation for marked first and second degree prolapse of, Frank C. Yeomans, 10
rectosigmoid and sigmoid, a statistical review of carcinoma of the, Louis A. Buie, 71
tuberculosis of the anus and, William M. Beach, 61
Research of pruritus of the perineum (pruritus ani, vulvae and scroti), an original bacteriological, Joseph F. Montague, 16
Sacral anesthesia in proctologic surgery, A. J. Murrieta, 35
Saphir, J. F., Anorectal operations under local anesthesia, 41
Discussion, 31, 39, 55
Sigmoid, a statistical review of carcinoma of the rectum, rectosigmoid and, Louis A. Buie, 71
Stricture, an original treatment for rectal, E. Jay Clemons, 81
Suggestions and criticisms, some admonitions, Joseph M. Mathews, 5
Surgery, sacral anesthesia in proctologic, A. J. Murrieta, 35
Terrell, Emmet H., Presidential address, 1
Topography of rectal and anal diseases, J. Rawson Pennington, 67
Treatment of anorectal fistula, the ambulant, Arthur C. Crookall, 49
rectal stricture, an original, E. Jay Clemons, 81
Tuberculosis of the anus and rectum, William M. Beach, 61
Yeomans, Frank C., Circular amputation for marked first and second degree prolapse of the rectum, 10
Discussion, 40, 59, 70, 71, 80
Zobel, Alfred J., Discussion, 47, 56, 59

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